

# MARINE REVIEW.

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No. 7.

## Coal Situation—Iron Ore Shipments.

The situation as regards soft coal shipments is probably the most interesting feature of the lake trade at this time. Figures at hand relate only to the Lake Superior coal movement, but this is, of course, most important. The shipments of soft coal to all Lake Superior ports last season, as shown by the St. Mary's Falls canal statistics, aggregated 2,626,130 net tons, which is a little above the average for three years past. Requirements this year, if the coal can be moved, will very probably be in excess of 1896. On August 1 of this year only 958,377 tons had been moved to Lake Superior, so that, figuring simply on a basis of last season's shipments, there is yet to be moved in round numbers 1,650,000, as against 1,303,376 tons moved after the first of August last year. But it must be noted that during the month of August last year 425,000 tons of coal were shipped to Lake Superior. During the present August the shipments will, of course, be very light, even if the strike is settled before the month is half over, so that it is safe to figure that if the supply of coal forwarded to Lake Superior is to equal that of last year, full 1,500,000 tons must be shipped during September, October and November. During these three months of last year the shipments aggregated only 878,000 tons. In the fall of last year the ore shippers were all cutting down the movement of ore, and there was no great shortage of cars as there is thus early this season. Taking all these facts into consideration, it certainly seems that the coal shippers, even if the strike is settled at once, will find great difficulty in moving their lake coal.

Reports from all ore shipping ports to the Cleveland sales agents show shipments to August 1 aggregating 5,415,560 gross tons, as against 5,682,308 gross tons on the same date a year ago, or a shortage of only 266,748 tons. The movement of ore in July was the greatest in the history of the business. This certainly indicates a comfortable condition of affairs among the ore dealers, but it is encouraging to note that within the past few days sales of ore footing up about 300,000 tons have been made.

## Sault River Dredging.

In the proposals for the big job of dredging in the St. Mary's river that are to be opened in the office of Col. Lydecker at Detroit, Aug. 31, there are four items. The first relates to Round island shoal No. 1, which is about 1¼ miles northwesterly from the old light-house on Round island, near the head of the river. A channel 300 feet wide has been dredged through the shoal, and the work now to be done is to widen the channel to 800 feet and deepen it to 23 feet throughout. At Round island shoal No. 2, which is about one mile northeasterly from the old light-house, the 300-foot channel is also to be widened to 800 feet and deepened to 23 feet throughout. The third item relates to shoals obstructing the upper approach to St. Mary's Falls canal. These shoals are about three-quarters of a mile west of the light-house on the southwest pier of the canal, and the work now to be done is in continuation of previous work in this locality, the purpose being to provide a straight channel 1,000 feet wide and 21 feet deep. At the Middle Neebish, fourth item in the specifications, the work to be done is to deepen the channel already excavated between sections 500 and 760, so as to make the least depth of water in this section 21 feet, and to widen the present channel about 30 feet between cross sections 52 and 900, or as much more as the contract price for work will permit; the exact amount of widening can not be determined until the price at which the work can be done is known, as the total amount available for expenditure on the work is about \$150,000.

## Grosse Point Cut.

A mistake is made in blaming the Lake Carriers' Association for the unsatisfactory arrangement of temporary lights on Grosse point cut, Lake St. Clair. The temporary lights, which were hurried into place in order to take advantage of the new channel before it was fully completed, were established under the direction of the Lake Carriers' Association, but it was expected that they would be in use for only a very short period. The vessel owners were soon relieved of the care of them by the light-house board, and they have been maintained by the government for several months past. It was thought after the board took charge of the lighting of the cut that permanent structures would be erected immediately, on account of the importance of the channel. Officers of the Lake Carriers' Association have suggested the great necessity of hurrying matters pertaining to the lighting of this channel, but the light-house board is probably in need of funds for the purpose. It is probable, however, that the present agitation of the subject will result in some improvement being made in the temporary lights, pending the erection of permanent structures.

Messrs. West, Hartley and Dedaker, all connected with the management of the Cramp ship yard, together with a son of Mr. Charles H. Cramp, are making a tour of lake ship yards. The gentlemen say that they are on the lakes simply for pleasure. Some time ago there was talk of the Cramps starting a ship yard on the lakes, but it is not at all probable that such a venture is contemplated at present. It is quite probable, however, that extensive improvements may soon be made at the big Philadelphia works, and that in view of these improvements the heads of departments who are making this trip are giving attention to the examination of ship yard appliances and methods generally.

G. A. R. encampment at Buffalo, N. Y.—The Nickel Plate road sells low-rate excursion tickets Aug. 21, 22 and 23. Tickets may be extended to Sept. 20. 232, Aug 21

## Statistics of Lake Commerce.

Everybody interested in lake commerce will be pleased with the announcement from Washington that a special bureau of the treasury department is to devote attention to the collection and publication of information concerning all branches of this commerce. Geo. H. Tunell, who has been selected to take charge of the new bureau, is known to readers of the Review. Through connection with the Journal of Political Economy, which is issued from the University of Chicago, he has contributed to that publication of late several valuable articles on lake commerce, all of which would indicate that he is in many respects fitted for the government work that has been assigned to him. The work of the new bureau will undoubtedly be purely statistical. Mr. Tunell will find that existing regulations on the lakes are of a kind that make it very difficult to secure reliable information regarding commerce of the lakes other than the small trade which we have with Canada. Regulations in the coastwise trade do not require reports that admit of a full summary of lake commerce being secured. This has proven a great drawback to everybody who has tried to make up detailed and comparative reports of the commerce at all lake ports. Probably the establishment of the new bureau in the treasury department will bring about the necessary changes in customs regulations. It is announced that for a time, at least, Mr. Tunell will remain in Chicago, sending from there the results of his work to Washington for publication in the monthly reports of the bureau of statistics. Eventually, his office will be established in the treasury department. His first work will be included in the annual report of the bureau of statistics to be issued this fall, and transmitted to congress in December by Secretary Gage.

## Combination Boilers.

Another vessel of the navy, the cruiser Atlanta, 3,189 tons, is to be fitted with a combination of water tube and cylindrical boilers. The alterations are to be made at the New York navy yard. Eight single-ended cylindrical boilers now in the vessel will be removed and six new boilers put in their place. Four of the new boilers will be of the Babcock & Wilcox water tube type, and the remaining two, cylindrical, single-ended, all designed for a working pressure of 180 pounds per square inch. The fire rooms will be fore-and-aft, as before, but space will be gained for a new athwartship bunker of about 102 tons' capacity. The old three-cylinder compound engine, with the high pressure cylinder between the low pressure cylinders, will be converted into a triple expansion engine. The old forward low pressure cylinder, 74 inches in diameter, will be replaced by a new high pressure cylinder 34 inches in diameter. The old high pressure cylinder, 54 inches in diameter, will be bushed to make its diameter 50.5 inches and to serve as the intermediate pressure cylinder of the new engine. The other low pressure cylinder will be retained for the same purpose in the new engine. The forward condenser will be removed, and the internal arrangement of the after one will be changed to give a better distribution of the steam and more cooling surface. The independent engines for driving the old air and circulating pumps, and the forward air and circulating pump will be discarded. The after air pump will be worked from the low pressure engine, and the circulating pump will be blocked off. A new centrifugal circulating pump will be installed.

Few persons looking at an ordinary ocean steamship, loaded or unloaded, as it lies in a dock, have any conception of its enormous carrying capacity. The boat looks big, of course, but gives no idea of the tremendous amount of freight that can be stowed away in its capacious hold without overloading it. The Baltimore & Ohio railroad loaded an ordinary freight steamer the other day, and this is what it took to fill her: Sixty-six cars of lumber, four of starch, nineteen of oilcake, six of provisions, one of grain, one of flour, twenty-two of tobacco, two of wire, three of sugar, thirteen of fresh meat, twenty of sheep, or 1,699 head; forty-five of cattle, or 888 head; three of lard, one of copper, four of merchandise and 161 of grain, making a total of 371 car loads. This is equal to ten long freight trains, which, if placed in a row, would cover a distance of about two miles. And all their freight went into one tramp steamship.—Philadelphia Record.

A correspondent of the London Times summarizes, in connection with the naval review of the Queen's jubilee celebration, the progress of the marine engine in the past sixty years. He says it embraces an increase of steam pressures from three to 155 pounds per square inch, excluding from the account the water tube boilers; an increase of piston speeds from 220 to nearly 1,000 feet a minute; a decrease in the weight of marine engines in proportion to the power they develop from 10 hundredweight to 1¾ hundredweight per indicated horse power, more than five times the power for a given weight of machinery; and a decrease in the fuel consumption proportioned to the power from five to seven pounds per indicated horse power per hour to two pounds. These figures are not the best attained, but they are regarded as fair on the basis of comparison adopted.

Nine contracts for the improvement of fifty-four miles of the middle division of the Erie canal were awarded at Albany a few days ago, the bids aggregating \$1,372,009.50. The Warren-Scharf Asphalt Paving Co. of New York secured two sections of the work at \$455,703; the National Contracting Co. of New York, three sections at \$496,777.50; John Dunfee & Co. of Syracuse, one section at \$136,600; W. B. Priddy of Spring Lake, one section at \$115,713, and Andrew Onderdonk of New York, one section at \$167,216.



### From the Engineer of the Meteor.

Editor Marine Review:—In your issue of July 15 a Detroit correspondent gives an account of the memorable collision between the steamers Pewabic and Meteor. The account is pronounced interesting, but it is incorrect in several particulars. I was chief engineer of the Meteor for nine years, and as I was in charge of her engines at the time of the collision, I feel that I should know something of facts pertaining to the sad affair. The Meteor and Pewabic were built in Cleveland in 1863 by the late Capt. E. M. Peck for J. T. Whiting & Co. Members of this company were the late J. T. Whiting, W. D. Walbridge and L. McKnight. These vessels were first-class freight and passenger propellers of about 850 tons, elegantly fitted out, and they were speedy for those days, as they made 11½ miles an hour regularly, and could be forced to a speed of 15 miles. They were two of the finest boats then afloat on the lakes. Their officers were as follows: Meteor—Captain, Thomas Wilson; mate, Byron Mills; purser, Charles Atwood; steward, Thomas Ryan; chief-engineer, John M. Cronenweth; second-engineer, Thomas Bucanan. Pewabic—Captain, Geo. P. McKay; mate, George Cleveland; purser, Charles A. Mack; steward, John Lynch; chief-engineer, Charles R. Jackson; second-engineer, Wm. Kennedy.

On the night of the collision the Meteor was bound up Lake Huron with a full load of passengers and the Pewabic was bound down. The weather with us (on the Meteor) had been very fine up to the time of the collision, but officers of the Pewabic reported that they had for some time been running in mist and rain. It was quite plain to my mind that the main cause of the collision was the deceiving weather—mist, rain and some fog. On both boats the mates were on watch when the collision occurred. The mate of our vessel, the Meteor, said that he saw the white and green lights of the Pewabic two points off our starboard bow about three minutes before the boats came together, and it was claimed that if the Pewabic had kept her course the boats would have passed each other in safety; but it was held by this same source of evidence that at all once the Pewabic shut out his green light and showed his red light. The Meteor's wheel was put hard a port and one blast of her whistle sounded, but it was too late. A mistake had been made, and in a few seconds the Meteor crashed into the Pewabic, cutting her about two-thirds in two. It has always been my opinion that the mate of the Pewabic was deceived by the condition of weather and had misjudged the distance between the two vessels. He thought he had plenty of time to pass to starboard. Many of the passengers who were saved jumped aboard the Meteor while the boats were wedged one into the other. About three minutes after separating, the Pewabic went down bow first. The pitiful cries of the drowning, struggling for help, are still in my memory, and will remain with me while memory lasts. Both crews did all they could to save life, but it was difficult to find people in the water. On account of the mist and rain the rescuers could be guided only by the cries for help. Your Detroit correspondent says he saw the lights of the Pewabic an hour before the collision. This is ridiculous, as two boats running at a speed of 11½ miles would have covered together a distance of twenty-three miles in an hour, and every sailor knows that a boat's lights cannot be seen for quarter of that distance. He says further that after the collision the Meteor began to fill very rapidly; that all of the mattresses and blankets were taken to fill up the hole, and that he, with most of the other passengers, was kept at the pumps the greater part of the night to keep the vessel from sinking. All this is wrong. As a matter of fact there was not a hand pump on the Meteor. Immediately after the collision I connected up the steam pumps, with which the Meteor was well supplied. She had one 8-inch pump worked from the main engine, three 8-inch pumps worked by the hoisting engine, two 3-inch syphons and a boiler pony, piped to pump bilge water. All were started, but it was soon found that two pumps were sufficient to keep her free. A hole in the bow of the Meteor was large enough to drive a horse through it, and it extended down to within 18 inches of the water, but we got the foresail around the bow and remained in the vicinity of the wreck until daylight.

"As there was nothing to be seen in the morning, we went on to the Sault, arriving there about noon. We made temporary repairs and were intending to proceed on our voyage up Lake Superior, but while going through the lock, about 7 a. m., we discovered fire working through the forward hatch. The passengers took their effects and went ashore. The Meteor was hurried into the guard lock and every effort made to put out the fire, but as we had made no headway up to after noon, I opened all the sea-cocks and allowed the vessel to fill with water. With the boat sunk to her deck the fire was soon extinguished. We then closed the upper guard gate and let the water out of the canal. The vessel was, of course, cleared of water at the same time. After closing the valves and opening gates to let water into the canal again, the vessel was soon floated. We fired up, relieved her of such water as remained, and were again at a dock discharging cargo. A hurried run was made to Detroit for repairs, and we were soon in Cleveland again, ready to take our regular time for the next trip. But in Cleveland the Meteor was libeled by underwriters for \$200,000. Her owners refused to furnish bonds and she remained out of commission for the balance of the season.

Among officers of the Pewabic who were lost was Mr. Jackson, the chief engineer. His young wife, who was making a trip with him, was also lost. He was a noble fellow, a good engineer, and he had many friends. No doubt, he might have saved himself had he made the effort, but he stood at his post of duty like a true "knight of the throttle," and went down with the ship, his wife with him. He died as he had lived, unselfish to the end. In early days of steamboats on the lakes it was customary, when boats were meeting in the day time (not at night) to check down and pass close together, so as to give an opportunity to throw a bundle of newspapers from one vessel to the other. At this particular period, during the late internal war, passengers were particularly anxious to get war news from the papers. There were no railroads and no telegraph connections, even with the upper Michigan peninsula. Your Detroit correspondent says that these two vessels were trying to pass close to each other in order to exchange papers. This is another mistake. We did not know what boat we were making until after the collision. He says further that we sent for a tug from Alpena to take the Pewabic's passengers to Port Huron. In this he is also mistaken, as it was the propeller Mohawk that was hailed to take the rescued passengers to Detroit. George Cleveland, mate of the Pewabic, who was in charge of

her at the time of the collision, was arrested and tried for manslaughter before Judge Wilkins of the United States district court. The present Justice Brown of the United States supreme court was then prosecuting attorney, and Wm. A. Moore of Detroit defended Mr. Cleveland. A number of captains from Cleveland came to Detroit to give testimony in the mate's behalf, among them Capt. Benjamin Sweet, Capt. Edward Turner, Capt. John Spaulding and others. They vouched for his ability, trustworthiness, etc., and they agreed that he acted according to his best judgment under the circumstances, which were of a deceiving nature. He was promptly acquitted.

J. T. Whiting & Co. were among pioneers in vessel business of Lake Superior. In the early sixties they controlled about two-thirds of this trade. In those days all contracts ended on the first of October, and for the balance of the fall vessels could charge what they saw fit. I have seen \$22 a ton paid for carrying copper from Ontonagon to Detroit and \$6 a ton paid as freight on pig iron from Marquette to Detroit. On our way up the estimated value of every square foot of room was \$1, and there was always enough freight left on dock when we were leaving to load another boat. Often the mate would have a \$10 bill slipped into his hand by an anxious shipper who wanted a jag of freight moved at once and would not wait for the next boat. But the ups and downs of life were with us then as now, and the steamboat business lacked stability. Take the case of J. T. Whiting & Co. In the spring of 1864 they owned seven boats, namely, the steamer Illinois, and propellers Meteor, Pewabic, Detroit, Mineral Rock, Gen. Taylor and Skylark. Not needing all of them, they sold the Detroit, Gen. Taylor and Skylark, and during the summer they laid up the Mineral Rock for a rebuild. A short time before the Meteor-Pewabic collision, the Illinois broke down and made a complete wreck of her engine. Then, with the Pewabic sunk and the Meteor tied up, the company was without a single vessel. They were forced to charter vessels to fulfill their contracts, and as a result of the collision the firm was practically ruined.

JOHN M. CRONEWETH,  
588 East Fort street.

Detroit, August 10, 1897.

### Sale of Rails Against British Competitors.

A number of interpretations have been put upon the report that the Maryland Steel Co. underbid the lowest English rail seller by £8,675 on 7,708 tons of steel rails for the East Indian railway. Some of our newspapers have promptly dwelt upon the wickedness of selling to foreigners at so low a price when home consumers are supposed to be paying much more. Unfortunately, the English bids are not stated, and therefore it is not known what the American selling price really was. Other journals jump at the conclusion that we have proven our ability to undersell the Englishmen \$5.50 per ton, and that therefore the world is ours. We believe that a very different aspect is put upon the matter when it is considered that the English rail makers have a combination, and that their present prices are very considerably higher than those made years since, in times of depression. To the trade here the most startling fact in connection with this order is that so large a cut was considered necessary to secure the business. But it is evident that only a part of the story was told in parliament by the secretary for India. The Maryland Steel Co. evidently were not bidding against English makers, but against American rival producers. On the face of it underbidding others to the tune of \$5.50 per ton looks like pretty poor commercial management, but probably Pittsburgh and Chicago were nearly as low. Let us give a point to those who love to do a little figuring and who take the English price as a basis with the aim of getting at the net price to the mill in this transaction. They must not forget that a tide-water plant, running on foreign ore, gets the benefit of the drawback of nearly the whole amount paid as duty on the ore. This is not far from \$1 per ton of rails, and may have had a good deal to do with the low price made. It will be seen that a closer study of the circumstances reveals the transaction in quite another aspect.—Iron Age.

### Heavy Salvage Award.

Newspaper dispatches from New York recently made brief reference to a decision in the salvage case of the Merritt Wrecking Co. of New York against the American line steamship St. Paul and her freight, which was stranded, some time ago, at North Long Branch, and which, in addition to her own value of \$2,000,000, had a cargo on board valued at \$1,999,133. The case was tried in the United State court for the southern district of New York, and decision in full is now at hand. For eleven days' salvage operations, in the course of which all the cargo was removed and transported to New York, and the ship was finally successfully floated, the plaintiffs were awarded \$160,000, including their outlay of \$10,000. The court held that such an award should be a recognition of the importance of the services of the salvors, the necessities of the ship and the success achieved, so as to be an inducement to the maintenance in the most efficient condition of such wrecking companies as were here employed, without which large steamers when stranded could not be saved from great injury and perhaps total loss. It appearing that during the first four days of the work all cargo was removed from the vessel and transported by salvors to New York for delivery to the consignees, the court held that such cargo was not liable for subsequent salvage in floating the ship, and that therefore the cargo should bear two-elevenths of the whole award, being its proportion for the time during which the salvage operation was for the common benefit. The court further held that specie on board should contribute to the salvage on its value in the same ratable proportion as other parts of the cargo.

Niagara Falls is the place,  
August 16 is the date,  
Nickel Plate is the road,  
Ask agents for the rate.

250, Aug. 15

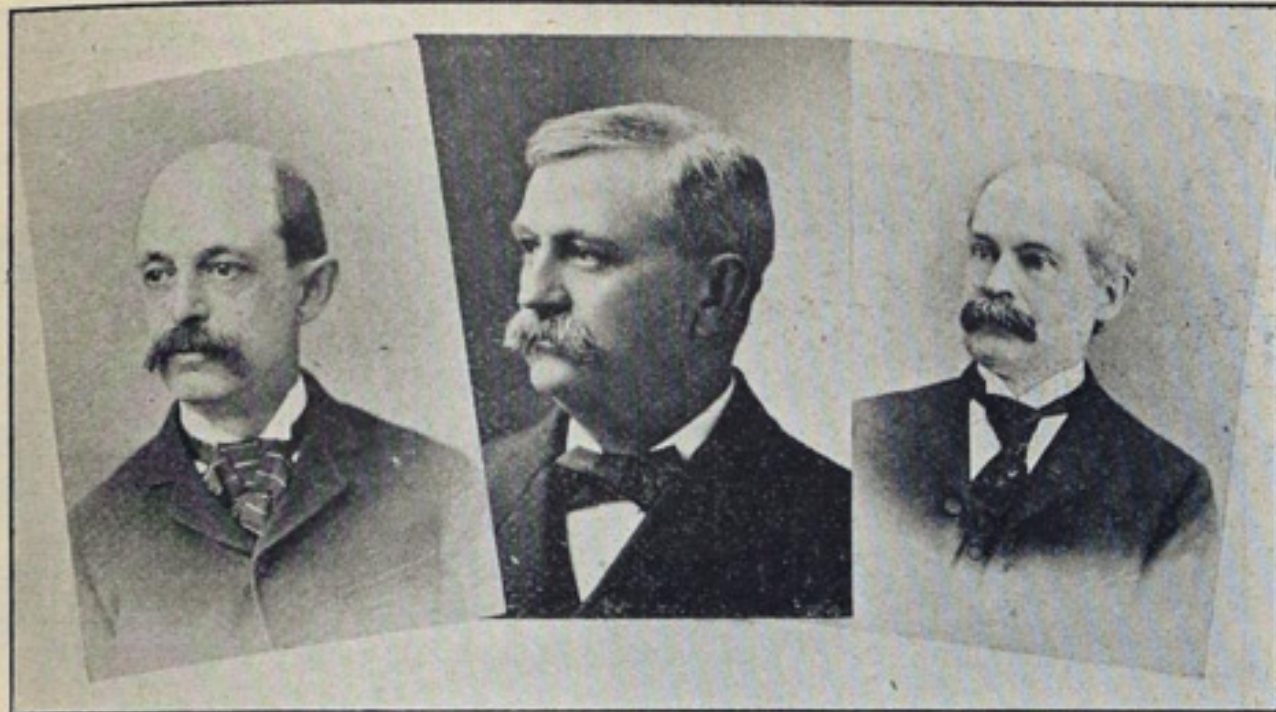
Ask any agent of the Nickel Plate road for reservations in sleeping cars, rates and time of special train excursion to Niagara Falls and Toronto, Aug. 16.

249, Aug. 15



### New Ship-Canal Commission.

Likenesses of the new commission of engineers, appointed recently by President McKinley to continue investigation of the subject of a deep waterway from the Great Lakes to the Atlantic seaboard, are presented in the accompanying group. This commission, which consists of Major C. W. Raymond of the army engineer corps, Alfred Noble of Chicago and Geo. Y. Wisner of Detroit, will pursue investigations begun by a similar commission about a year ago. They will have the advantage of a large appropriation, \$150,000, provided in the last sundry civil bill for expenses attending their work. It is expected that the first meeting of



MAJOR C. W. RAYMOND. ALFRED NOBLE. GEO. Y. WISNER.

the commission will be held in Philadelphia shortly. Major Raymond, the army officer on the commission, is quoted as saying that the work will be pushed with a view to reporting at the next session of congress.

### The Lakes Furnishing Men for the Navy.

Officials of the navy department will undoubtedly be well pleased with the experiment of enlisting men from lake cities for general service in the navy. The recruits are said to be of an excellent class. In a note to the Review from Chicago, Lieut. Commander John M. Hawley, who is in charge of this work, says:

"At Duluth thirty-one men were secured, and they were sent to the receiving ship Vermont at the navy yard, New York, this as a result of eight days' enlisting. The office in Chicago was opened Monday afternoon, Aug. 2, and the record for the first week is fifty accepted and about the same number rejected for physical disabilities. The class of men thus far secured is excellent. Only seamen, ordinary seamen, machinists and a few apprentices are enlisted. The first draft of Chicago recruits left for New York on the 8th inst., in charge of Acting Boatswain Brayton. The men will be sent east in batches of fifty. The office in Chicago will remain open about three weeks and then be shifted to either Milwaukee or Detroit."

Seamen in the navy get \$24 a month, and must be between twenty-one and thirty-five years of age; ordinary seamen, \$19, and from eighteen to thirty years; shipwrights, \$25, and from twenty-one to thirty-five years; machinists of first-class, \$55, and from twenty-one to thirty-five years; of second-class, \$40, and same age; coppersmiths, \$50, and from twenty-one to thirty-five years. Chief machinists get \$70 a month, and chief carpenters' mates \$50. In addition to this they get rations, medical attendance, and, in fact, everything except clothes. When a man enlists it is for a term of three years. Whenever he re-enlists he gets \$1 additional to rate of pay and three months' bounty. For instance, if a man draws \$50 a month and re-enlists, he will get \$51 a month and a bounty of \$150. Every man, too, has a chance of promotion if he deserves it. Machinists who have had experience at sea with marine engines may be enlisted in the first class, those with no experience as second class.

### Arguments for Improved Fog Signals.

Newspapers of the lakes will not be at fault if the United States light-house board fails to take action with a view to reducing the time between the beginning of a fog and the blowing of signals at fog signal stations on the lakes where machinery is not of improved kind. All of the papers are directing attention to the danger of accident from delay in beginning the operation of these signals after a fog sets in. The Detroit Free Press cites as a case in point the accident to the wooden steamer Neshoto, which was stranded on Keweenaw point, Lake Superior, some time ago. The Neshoto was bound to Duluth with 2,000 tons of coal. The fog came on suddenly, blown down by an easterly wind. The aim of the master was to clear Manitou island and the point by a safe margin, but he did not wish to run a long way out into the lake to do it. He did clear the island just after the fog came down, and supposed he had a good stretch of water between himself and the point, when the big steamer struck the rocks. The shock was a fearful one. The rocks were half round boulders. The big boat, urged on by her speed of eleven miles an hour and by her heavy cargo, surged and grated onward until, when she finally stopped, her 7-foot mark was showing at the bow, and her stern sank in 26 feet of water. Then she took a list to port and went over 4 feet. The strain on the strong wooden hull was a hard one, but after several days of lightering, jacketing, pumping, jacking and pulling, the wrecker Favorite finally released her. But the loss was in the neighborhood of \$40,000, including the wrecking bill.

Excursion to Chautauqua lake and Lily Dale on Cassadaga lake via the Nickel Plate road, Aug. 13. See agents for time of trains and rates. 258

Take the annual excursion via the Nickel Plate road, Aug. 16, to Niagara Falls and Toronto. Secure sleeping car space early. 248, Aug. 15

### Fear of a Grain Blockade at Buffalo.

A great deal of delay is already encountered at Buffalo in unloading grain. There are two elevators at that point outside of the association, namely, the Raymond elevator and the Export elevator, and it is supposed that they are handling grain at less than association rates. Many vessels are chartered to unload at these elevators, and when it is stipulated in the bills of lading that the cargoes are to be unloaded at the Raymond or the Export, as the case may be, it follows as a matter of course that the vessels are to be unloaded at those elevators, but they are also bound to take their turn unloading, and, as very frequently cargoes arrive faster than the elevators named in the bills of lading can handle them, delays are unavoidable.

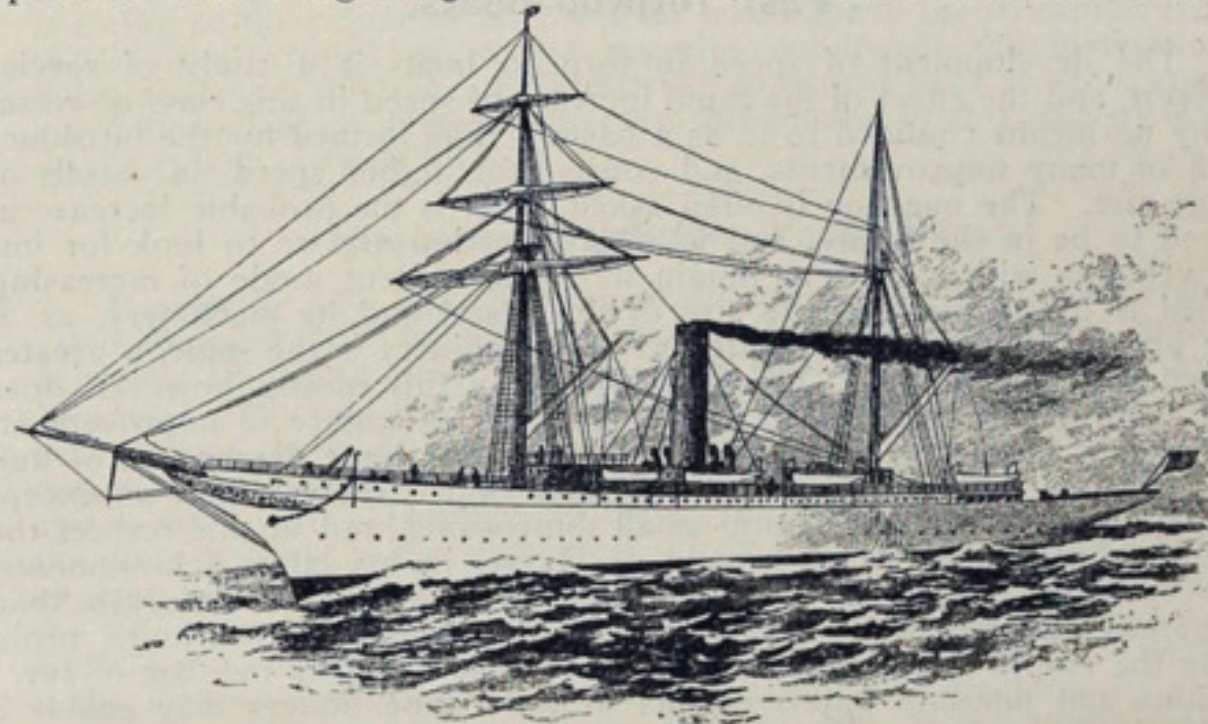
Where there are no particular elevators named in the bill of lading, it is almost invariably the case that the cargoes are split up into several different consignments. In that case each consignee has a right to dictate where he shall have the cargo delivered. In fact, he has the same right with a portion of the cargo as he would have if the entire cargo was for him. The result is that the vessel may receive prompt unloading with one, two or three different consignments, and be badly delayed in getting rid of the balance. To the vessel owner this custom of having a great number of consignments in one cargo is a growing evil. Ten years ago it was only occasionally that there were more than one consignment in a cargo, but now a cargo confined to one consignment is rare, and it is becoming more and more the custom to split the cargoes up into small lots. Very often cargoes are loaded and sold in transit in large or small quantities for shipment over different roads, and it not infrequently happens that there is no disposition of the cargo made until after the arrival of the vessel at Buffalo. It would be no greater hardship to the vessel owner if he were compelled to peddle cargoes of coal and iron ore out in the same manner. Another disadvantage of split cargoes is the difficulty of tracing shortages in such cases.

Buffalo is receiving grain now about as fast as it can comfortably take care of it, and if the expectation of a large movement of grain by lake during the fall is realized, a blockade worse than that of the fall of 1891 will very probably be the result.

### A Millionaire's Yacht.

One of the most elaborate yachts owned by American millionaires is the Mayflower, designed by G. L. Watson for Ogden Goelet of New York, and built at the yard of the Clydebank Engineering & Ship Building Co., Ltd. She is a vessel of 1,780 tons gross and 1,009 tons net measurement. Her length is 275 feet on the water line, 320 feet over all, beam 36 feet 6 inches, and depth 30 feet to the bridge deck. The hull is divided into nine water-tight compartments, so arranged that it would float though two compartments were full of water. The arrangement of decks is somewhat peculiar. There is a short fore-castle, separated from a long bridge amidships by a well, but the side plating is carried in an uninterrupted line aft nearly to the end of the bridge. Here it is lowered 4 feet on a line with the main deck bulwarks, and is carried at this level to the overhang. The interior finishings and furnishings are unusually magnificent, and everything pertaining to the comforts of a modern home are provided in the vessel.

There are two triple-expansion engines of the four-cylinder four-crank type. Dimensions of cylinders are 22½, 38 and two of 40 inches, with 27 inches stroke. Piston valves are used on the high pressure and intermediate cylinders and patent slide valves are fitted to the low-pressure cylinders. All are balanced. The valve gear is of the Stephenson link pattern controlled by a combined steam and hydraulic engine. The frames are open front with steel stanchions, the back frames carrying the condensers. Very complete auxiliary apparatus is fitted, including evaporators, feed water filters, auxiliary condenser, feed, bilge, sanitary and fresh water pumps. The electrical installation is in duplicate and gives current to about 700 lamps. Steam is generated at 160 pounds pressure in two large single-ended boilers, each fitted with four furnaces.



OGDEN GOELET'S YACHT MAYFLOWER.

On her trial trip the Mayflower developed 4,600 horse power and obtained a maximum speed of 16.75 knots. Her coal capacity is 530 tons, with which she can steam 2,000 knots at full speed, and 6,000 knots at 12 knots speed. The illustration is from Marine Engineering and is a reproduction of a drawing made by Geo. L. Coffin.

The Marine Review has prepared in neat oak frames cards containing the schedule of time required to be run between certain points in the St. Mary's river under the speed limit of seven miles an hour. When hung in a pilot house, distance and time may be readily noted from these cards, as the type is large. They will be sent by express to any address at \$1 each, or may be had upon application at 409 Perry-Payne building, Cleveland, for 65 cents each.

The Review has excellent photographs of lake ships.



### Militia of the Lakes.

The recent visit of Assistant Secretary of the Navy Theodore Roosevelt to the lakes will undoubtedly prove advantageous to the several naval reserve bodies that have been organized in Illinois, Michigan and Ohio within the past few years. In a special report dealing with the condition and efficiency of these organizations, he speaks of them in the highest terms, and says that the best trained battalions now on the lakes could be used immediately on regular ships of war. "This applies," Mr. Roosevelt says, "to the militia of the lakes, as well as to the militia of the seacoast—and certainly no greater tribute is necessary to pay to the lake militia. I am aware that this statement will seem very surprising to those who are unacquainted with the progress that has been made by certain battalions of the naval militia, but I am so thoroughly convinced of its truth that I shall recommend that next year the experiment be made of giving a couple of our small cruisers of the Bennington and Machias, or possibly of the Detroit class, one to a specially selected battalion from the coast and one to a specially selected battalion from the lakes, for the annual sea practice. The captain and executive officer and navigator would be kept on board. It might also be that the engineers would have to be kept aboard, as it is apparently only among the Second Illinois battalion on the upper Mississippi that any special effort has been made to develop machinists who could be immediately used on board warships. But every other position could be filled well from certain of the naval battalions which have been longest in existence, and which, together with length of service, have to their credit the best use of opportunities. These ships would be sent say, from New York to Hampton roads and back, stopping for target practice and the like. From such a cruise it would be possible to learn exactly the capacities of the naval militia. Of course, only the very best battalions could be considered in connection with it, for no battalion would be sent on such a cruise until long and faithful training had fitted it to do the work, and until its members had repeatedly shown themselves, in the opinion of the naval officers who have been with them on their annual cruises, competent for the trial.

"I found in the inspection of lake organizations that the First Illinois battalion is fortunate enough to have two naval academy graduates at its head, and it shows in every way the excellent results of their training. It is already doing excellent work and is steadily improving. The Second battalion deserves particular credit, inasmuch as it has started on a river and is without the advantages afforded by the ocean or the great lakes. This is the battalion which has paid such particular heed to the development of machinists. If possible, when the torpedo flotilla is sent up the Mississippi, the men of this battalion should be given drill and instruction aboard the torpedo boats.

"In Michigan I was only able to see the First and Third divisions, and from their commander to the most recently enlisted landsman I have nothing but praise for the workmanlike way in which their duties were performed. No battalion on the coast can make a better showing. The discipline is excellent. The commissioned officers, aside from the commander, who is a naval academy graduate, have all worked their way up through the ranks; and the seamen, ordinary seamen, and landsmen (who, as is proper, form the bulk of the battery, for no landsman is made an ordinary seaman or seaman until he has passed the rigid examination requisite to show his fitness) are for the most part business or professional men, who are actuated simply by a sincere spirit of patriotism, and who show by their efficiency the effect of painstaking and faithful performance of duties, which must often be irksome. I consider these divisions fit now to be put in charge of one of our smaller cruisers.

"The Ohio naval brigade has just begun its existence. The men showed a most praiseworthy spirit and purpose, and I would particularly call attention to the wise generosity of the state of Ohio in uniforming them so well and so quickly, and in a very short time, if they continue as they have begun, they will amply prove the wisdom of that generosity."

### Fast Torpedo Boats.

The development of speed in torpedo boats is a study of special interest, and the effect of the rapid increase of speed in this class of vessel is by no means confined to it, as a basis is thus formed for the introduction of many improvements, and consequent higher speed, in vessels of large size. The question is often asked, what is the probable increase in speed to be in the future, and in what direction are we to look for improvements with a view to obtain it? One evident mode of increasing speed is by augmenting the size of the vessel and its machinery, as, if the proportion of weight allotted to the machinery is the same, a greater speed will be obtained. To secure speed by this means, however, does not involve any special skill or anything in the nature of improvement. All that is necessary is simply to reproduce the same description of hull and engines, but of a larger size. Greater skill is shown where an exceptional speed is obtained within small dimensions, and in this respect the results obtained by M. Normand of Havre, in his latest achievements, are specially creditable. No doubt, material of greater strength than generally adopted would admit of lighter scantlings for the hulls; probably the engines themselves may be driven at a higher number of revolutions and possibly improvements in water-tube boilers may enable a reduction of weight to be secured without loss of efficiency. Aluminum may also be introduced, as a substitute for heavier metals. It is in the saving of weight for power that advance may be looked for in the immediate future, and the shipbuilder can now see his way to obtain from 32 to 34 knots.—A. F. Yarrow in Cassier's Magazine.

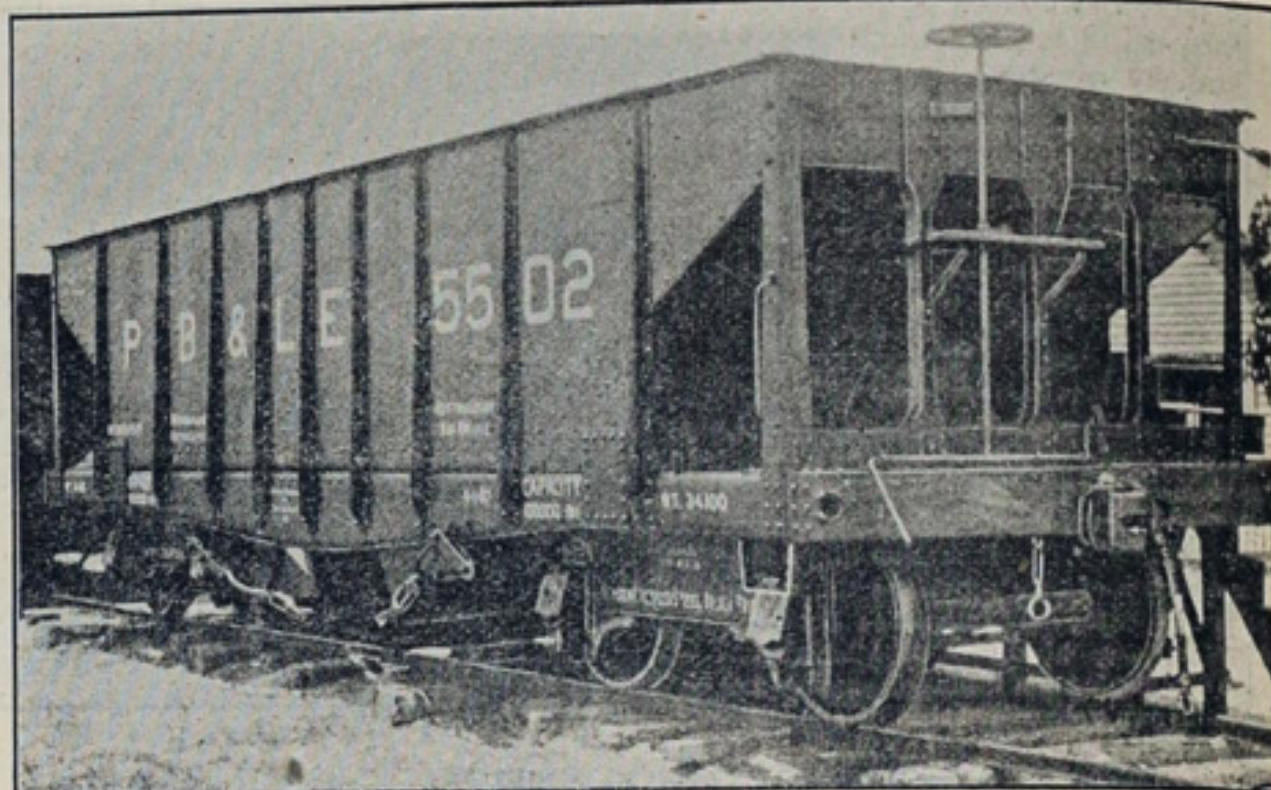
Buffalo papers report that the New York Central has bought 400,000 tons of bituminous coal, to be delivered at Buffalo and Rochester during the coming year, at \$1.20 and \$1.25 a ton, the lowest prices ever recorded. The contract is divided between the Rochester & Pittsburgh Co., the Fairmount Coal & Coke Co. and Osborn, Saeger & Co. of Cleveland.

Aug. 13 the Nickel Plate road will sell excursion tickets to Chautauqua lake. Ask agents. 256

Visit the Cleveland Grays who are in camp at Chautauqua. The Nickel Plate road runs a low rate excursion Aug. 13. 257

### Steel Ore Cars.

There is presented herewith an illustration of one of the 50-ton steel ore cars, 600 of which are being built by the Schoen Pressed Steel Co. of Pittsburg for the Pittsburg, Bessemer & Lake Erie Railroad Co., the corporation operating the Carnegie coal and ore railway between Conneaut and Pittsburg. These cars represent the most advanced ideas that have thus far been embodied in steel car construction, and if they prove successful they will have a decided influence in determining the ultimate type of steel car that is quite certain to soon supplant the wooden car in heavy traffic. The chief point which may be set forth as a claim to



NEW TYPE OF 50 TON ORE CAR FOR CARNEGIE ROAD.

superiority in the construction of these cars is the lightness of the structure when considered in conjunction with their carrying capacity, and as compared with the weight of wooden built cars of similar capacity. The total structural weight is 34,000 pounds.

The construction of a car of this kind is thus briefly described in the Railway Review: "It consists of four main sills 10 inches deep at the end and gradually increasing to 17 inches at the mid-length where the greater swaying burden is supported. The single formation of the side sheet with flanges at top and bottom, and its through riveting with the top flange on the side sill practically constitutes the entire side of the car as a single girder. To the center sill are riveted two longitudinal hoods and one transverse hood, which construction adds materially to their strength. The body bolster is placed on top of the sills, which is an advantage in the reduction of the total height of the car from the top of the rails. This body bolster is made of a rectangular piece of steel. Because of the bolster being deeper at the center than at the ends, the surplus of metal toward the end affords opportunity for converting it into gusset plates, which are riveted to the flanges of the side sill and side sheeting. A flange is also turned up on the ends of the bolster and is riveted to the side sheeting, which is re-enforced by a rectangular plate on the outside, 1/2 inch thick. In addition to this the bolster is braced and tied to the sill by triangular brackets. The end sill of the car is pressed out of one sheet of steel and is re-enforced by gusset plates which are riveted to it and the main sills of the car. The car is tied together by a transverse hood and hopper and by the several shapes which are employed. The Westinghouse friction draft and buffing device is used upon these cars, and also the automatic air brake. The brake cylinders are located under the hopper, near the end of the car."

### Gas and Electric Buoys.

A street railway manager, who is interested in vessel property, and who recently made a trip up the lakes, returned to Cleveland a few days ago with a grand scheme for lighting the Sault river by electricity. With time on his hands he had figured it out fully to his own satisfaction. His company had used electricity extensively for lighting purposes in connection with a trolley system of street railway, and he was able to present his views of river lighting to a party of Cleveland vessel men, at the same time urging them to take the matter up with the light-house board and urge its adoption, not only for the Sault river but for other channels on the lakes. But he was met with an objection which he had not taken into consideration. The practical vessel man wants nothing to do with electric lights for signal purposes, either aboard his ship or in light-houses of any kind. To the vessel man the thought of some unknown power cutting off the current and leaving a channel in darkness is the great objection to electric lights. Gedney's channel, New York, is lighted by electric buoys. Here is an item regarding them from the New York Journal, just at hand:

"The pilot commissioners are sometimes twice a month notified that the electric lighted buoys in Gedney's channel are out. In fact, these buoys are becoming a nuisance on that account, although the light-house board is doing its best to keep them going. It is the consensus of opinion that these electric lighted buoys should be discontinued and replaced by a more reliable system of lights."

All interests on the lakes have taken to gas buoys on account of the certainty of service to be derived from them, and from the fact also that they may be located singly or in numbers at places where it would be impracticable from a commercial standpoint to operate electric buoys. The success that has attended the establishment of Pintsch gas buoys on the lakes will go a great way towards increasing the use of them throughout the country.

Aug. 16 is the date for the annual Niagara Falls excursion via the Nickel Plate road. Sleeping cars attached. 247, Aug. 15



### A Modern Package Freighter.

The steamer *Starucca*, which was launched by the Union Dry Dock Co., Buffalo, on Thursday last, was practically ready to take on cargo when she left the ways, and she is now in commission. This steamer will prove a valuable addition to the Union Line (Erie Railroad Co.), as she is a modern package freight carrier and worthy of a full description.

The *Starucca* is a steel spar deck steamer with water bottom 54 inches deep. Her main hold is divided into nine compartments with substantially constructed bulkheads of steel. Dimensions are: Extreme length over all at rail, 346 feet 10 inches; moulded length, spar deck, 343 feet; length, keel, 325 feet; depth, 28 feet; beam, 44 feet; sheer on spar deck, 4 feet forward, 2 feet 6 inches aft; sheer on gunwale, 5 feet 3 inches forward, 3 feet aft. The decks, main, spar and top-gallant fore-castle, are entirely of steel, with no wood sheathing. The spars, two in number, are made of steel plate in three courses, riveted with steel rivets; they are 100 feet long and 24 inches diameter at deck, tapered to 6 inches at truck. This vessel is built with channel floors and Zee bar frames above the tank, and great care has been exercised in determining size and weight of material used in construction, the result being an unusually strong ship. For handling water ballast she is equipped with two vertical duplex pumps, 8 by 14 by 16, manufactured by the Deane Steam Pump Co. of Holyoke, Mass., and a single system of piping with a 10-inch main and 6-inch suction in each compartment, all valves being operated from the deck.

The engines were built by the King Iron Works of Buffalo and are of the vertical inverted triple expansion type, with three cranks and with cylinders 22, 38½ and 64 diameter, and 42 inches stroke. The engines are modern in every particular. There are four Scotch boilers, built by the Lake Erie Boiler Works of Buffalo, two of them being 11 feet 6 inches diameter and 13 feet long, and two 11 feet 6 inches diameter by 12 feet length, with two furnaces built in each. All four boilers are to carry a steam pressure of 175 pounds. Between decks there is a double-cylinder vertical hoisting engine, having cylinders 10 by 12, with line shafting operating double drums for all hatches. The steamer is also fitted with steam capstan and steam windlass, manufactured by the American Ship Windlass Co., Providence, R. I., and two Dunn stockless anchors, manufactured by the Standard Steel Casting Co. of Thurlow, Pa. The steam steering gear is of the latest pattern, manufactured by Williamson Bros. of Philadelphia. This, with the electric light machinery is placed in the main engine room, so that it will be entirely under the control of the chief engineer. The electric light plant consists of two Westinghouse dynamos, each 5¼ K. W., 125 volts, direct connecting to two Westinghouse junior engines with 6 by 5 cylinders. This plant was installed by the builders.

Crews' quarters are located on the spar deck, the deck houses being of wood with steel coamings. They are of sufficient size to give ample room for all the crew, and they are heated throughout by steam and lighted by electricity. It is expected that the *Starucca* will carry 4,150 tons on 16 feet of water. At this draft she has a displacement of 5,610 tons, and it is expected she will have no difficulty in making 14 miles an hour.

### Around the Lakes.

A few small coasters are the only new vessels listed in the August supplement of the Inland Lloyd's register.

Plans and specifications for the new life-saving station near Port Huron have been prepared, and it is expected that the contract for construction will be let shortly.

Grain men at Fort William are again talking of constructing a new elevator. They contemplate using steel in the construction, and it is proposed also to make the elevator one of the largest at the head of the lakes.

A new fog signal station at Menominee, Lake Michigan, is ready for service. There are two plants for use under different conditions, and it is said that the stronger whistle can be heard at a distance of twenty-five miles.

Detroit papers report a falling off in the stock of the Detroit & Cleveland Steam Navigation Co. from \$35 to \$30 a share, but it is quite probable that if any of the stock was offered at the latter figure buyers for it could be readily found in Cleveland.

Receipts filed in the United States district court at Duluth show that the steamer *George G. Hadley* has paid the \$5,000 salvage awarded recently to the owners, master and crew of the steamer *Arabia*, which picked the *Hadley* up on Lake Superior in a disabled condition in November, 1894.

Capt. Freeman, well known to marine men in all parts of the coast as the manager of the marine and electrical department of the Mutual Life Insurance Co. of New York, is on the lakes establishing state agents. The lake agency for New York has been placed in the hands of Capt. J. H. Killen of Buffalo, and the Ohio office will be in charge of Capt. V. D. Nickerson of Cleveland. This specialty with the Mutual Life, which is the greatest insurance company in America, has brought out an immense patronage from marine men in the east.

An excellent chart of Green bay and approaches on a large scale has just been published by the United States hydrographic office and may be had from the Marine Review. The chart is corrected to March 1, 1897, and takes in, with Green bay, the west shore of Lake Michigan from Manistique to Keweenaw. It will be of great value to masters of Lake Michigan trading vessels, as well as the men in charge of the larger ore and coal carriers trading to Escanaba. Soundings are in feet and there is a scale of statute miles attached. The price is \$1.25, but the chart is so complete in detail that it is larger than the single sheet charts of either Lake Superior or Lake Michigan.

There are no less than thirty women light-house keepers in the employ of the United States at present, and some of them have been in the service for forty years. Harriet E. Colfax, keeper of the light at Michigan City, Lake Michigan, was appointed in 1861.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

### Failure of Crank and Other Shafts.

One of the papers read at the recent Congress of Naval Architects and Marine Engineers in London is worthy of especial attention from ship owners in this country, as it deals with a subject that has been discussed a great deal of late, namely, the failure of crank and other shafts in the mercantile marine. The paper was presented by Mr. G. W. Manuel, superintendent engineer of the Peninsular & Oriental Steam Navigation Co. It is the result of careful observation on all kinds of defects in various kinds of shafts. As the P. & O. Co. has been particularly free of accidents from the breaking of shafts, and as it is the largest steamship company in the world, the officers of the Bethlehem Iron Co. in this country, who are leading manufacturers of steel forgings, and who have been carrying out an educational programme among ship owners on the subject of steel forgings versus wrought iron, will be especially pleased with Mr. Manuel's conclusions. He says:

"Iron is now less used, especially for crank shafts; steel is gradually taking its place in ocean-going steamers, except for propeller shafts. Iron shafts are, I may say, made up of thousands of small pieces of selected iron, generally termed scrap, cuttings of old iron boiler plates, good navy ship iron, cuttings of forgings, old bolts, horse shoes, angle iron, all welded together, forged into billets, re-heated and rolled into bars, cut into lengths, and formed into slabs of suitable size for welding up into the shaft. Before the use of steel generally, considerable improvement on the old method of faggoting, so-called, had been made, more powerful forging hammers used, along with more suitable furnaces and fuel; still, with all this care, I may say there is not an iron shaft without flaws or defects more or less, and when these flaws became placed during the construction of the shaft in proximity to the greatest strain, and though there was no hot bearing (which no doubt would have made matters worse), they often extended until the shaft became unseaworthy; and, after all, the best wrought iron that could be made of the finest scrap from the best qualities of selected brands, iron shafts are 60 per cent. inferior in strength to the best mild cast steel made on the open-hearth system, cast into ingots, and forged down under the hydraulic hammer or press."

Referring to mild steel forged shafts, Mr. Manuel says: "The term mild steel applied to shafts in a general manner does not in my experience represent the condition of the shaft, for I have found very great differences in the value and quality of mild steel (even as much as I found in wrought iron), depending largely on the qualities of the iron used and the chemical and moulding operations of converting it into steel, and also the amount and description of mechanical work applied when being forged into shafts. In this connection there are appended tables showing these differences by actual tests. Mild steel was first used by the P. & O. Co. in 1880. The dimensions of the shafts were limited by the same rules as those for wrought iron shafts. The steel was made by the best makers, having a tensile strength of twenty-four tons per square inch, it being then considered inadvisable to exceed this limit on account of former experiences with high tensile steel. The shafts made were crank shafts, and are still running. They have been in use seventeen years, and up to the present date no flaws of any description have been seen. The engines have been tripled, using the same shafts and bearings, and the working power increased. The percentage above the board of trade and Lloyd's rules, which fix the minimum size, is 24 per cent.; a percentage above the rules must be allowed, according to the experience of all ship owners, the same varying from the record of mishaps and losses and from the condemnation of shafts by the surveyors of the board of trade and Lloyd's registry. Since these shafts were first used the tensile strength of mild steel has been gradually increased, and we are now using it at thirty-two tons per square inch, the steel possessing equal, if not more, ductility and toughness, and suited to endure even greater strains than formerly. This has been arrived at by continued improvement in manufacture by the makers, so that the percentage allowed above the rules is now reduced to only 6 per cent., leaving a very slight margin. I mention this as there is an opinion that the reason some shafts are so free from mishaps is owing to their dimensions being so much above the rules that regulate those sizes, instead of to the superior quality of the material used. Tests shown in the tables here referred to extend back to 1880, and they are independent of anything that has been done in this line by Lloyd's or the board of trade."

### Enquirer-Pathfinder Yacht Race.

Everybody who had anything to do with the building of the Buffalo yacht *Enquirer* is, of course, very much pleased with her latest success in defeating Chicago's finest pleasure craft, the *Pathfinder*, owned by Mr. Morgan. Although the race occurred more than two weeks ago, the papers around the lakes are still discussing it. As the *Morgan* yacht was designed by Boeckel of Racine, who was associated with the Herreschoffs, and is fitted with a Thornycroft boiler, the victory of the *Enquirer* is all the more pleasing to her supporters. It is also noted that the *Pathfinder's* engines, which are of the quadruple type, are more powerful than those of the *Enquirer*. The *Enquirer* was built by the Union Dry Dock Co. of Buffalo and engined by the Frontier Iron Works of Detroit. Her boiler is the Taylor upright water tube sectional boiler, manufactured by the Detroit Screw Works, and the fuel she used was Pocahontas smokeless semi-bituminous coal.

Officers of the revenue cutter service, treasury department, will soon call for bids on another cutter, which is designed especially for service at New York, and for which an appropriation of \$175,000 is available. This new cutter will be named the New York and will be about the size of the naval vessel *Bancroft*, which is attached to the European station. The New York will have a displacement of 708 tons, will be 188 feet long by 30 feet beam, and will be required to make 16 knots on her official trial.

Lists of names of captains and engineers of lake ships, appointments of 1897, may be had from the Marine Review for \$1. Vest pocket size.

The Nickel Plate road sells homeseekers' excursion tickets at extremely low rates, Aug. 17. Ask agents. 251, Aug. 16





DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio,  
by John M. Mulrooney and F. M. Barton.

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binders sent, post paid, \$1.00. Advertising rates on application.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	1892	1893	1894	1895	1896	Total
Number of vessels.....	204	169	175	106	93	117	864
Gross Tonnage.....	111,856.45	45,968.98	99,271.21	41,984.61	36,352.70	108,782.38	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages.....	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered.....	17,249,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation.....	232	231	234	365	365	365

\*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

Very many persons who read of the achievements of torpedo boats and fast steam yachts, which carry thousands of horse power on a very small displacement, do not credit the statements made as to power, for the reason, possibly, that they see yachts of similar displacement in use daily with only a tithe of the power that torpedo boats have. The facts stated in regard to the power developed by the boilers are correct, but the conditions under which the boilers are used are very different. In the case of the ordinary yacht the pressures are lower, not over 150 pounds as an average, and not even that in many cases, but torpedo boat boilers are run at 200 pounds to 250 pounds per square inch, while the engines themselves are very high-stage expansion. This last, says the Engineer of New York, is the secret, if we may call it by that name, of the power developed for a given amount of heating surface. Suppose, for example, that a boiler is large enough to supply a 3-inch by 5-inch cylinder at natural draught and 150 pounds per square inch above the atmosphere. If this boiler is of a type capable of carrying 250 pounds per square inch, and the cylinders are tripled or quadrupled, as the case may be, the boiler has really no more to do than with the 3-inch by 5-inch cylinder, for the reason that but one cylinder—the high-pressure—has to be filled, the other two or three cylinders (which develop powers equal to the high-pressure) being—as we may express ourselves—clear gain. Thus it will be seen that what was only a 5 horse power boiler in round numbers has become, through the use of high-stage expansion engines, 15 horse power, without any increase in weight or dimension.

It was Capt. Charles D. Sigsbee, late chief of the hydrographic office, who was in charge of the U. S. S. Maine when she crashed into a New York dock several days ago, and vessel men of the lakes, who know of Capt. Sigsbee's abilities as a naval officer, will be pleased to learn that instead of a reprimand, he was specially complimented by Acting Secretary Roosevelt upon the report of a board ordered to investigate the collision. It is unfortunate that daily newspapers jump at conclusions regarding accidents of this kind. Mr. Roosevelt is not the kind of an official who would cover up negligence or wrong-doing in his department, and Capt. Sigsbee has reason to feel very proud of the compliment that followed investigation of this accident. It was conclusively proven that in a tight place he was forced to choose between collision with a crowded passenger steamer or with a dock. He ran into the dock without injuring his vessel, and, as the accident was inevitable, it is not probable that the government is responsible for the damage to the dock. In a letter to Capt. Sigsbee the acting secretary of the navy says: "The department congratulates you upon the promptness and correctness with which you solved the problem as to which of the alternative courses you should pursue in the critical situation in which, without fault of your own, you found yourself upon the occasion referred to. The readiness with which you met the needs of the occasion shows that you possess those qualities which are called for in every great crisis. You have reflected credit upon yourself and upon the service to which you belong."

The proposition to transfer the office of engineer of the tenth light-house district from Cleveland to Oswego should receive immediate attention from the United States light-house board. Col. Jared A. Smith of Cleveland, district engineer of the war department, a short time ago asked to be relieved of the duties of engineer of the tenth light-house district,

and the request has been granted by the chief of engineers. It is understood also that the office is to be transferred to Oswego, with the duties assigned to the government engineer at that point. The Review has no interest in Cleveland against other cities of the lakes, but it would certainly seem that the management of light-house affairs on the lakes is already too widely separated and that the transfer of this office to Lake Ontario will tend to still further complicate the service. It has always seemed strange that some plan could not be devised whereby the affairs of the light-house institution on the lakes could be managed through one principal office, or at least through one supervising engineer officer and one supervising naval officer. The proposed transfer of the Cleveland office to Oswego should be taken as a basis for bringing up this whole subject, and vessel owners would undoubtedly find it to their advantage to take an interest in the matter.

Although leaders of labor organizations in the Lake Superior iron mining region profess their ability to force out of the mines all men who are not connected with their union, it is not probable that they will make any progress with such an undertaking this fall or that there will be a suspension of work in any of the mines on account of agitation of this question. The men are informed regarding the condition of the iron mining industry and they know that in the event of serious trouble every mine in the several Lake Superior districts could suspend operations very early this fall with very little injury to the interests involved. A suspension of mining operations might, in fact, be regarded as the best thing that could possibly happen to the industry. The men themselves would certainly be the greatest sufferers, as low lake freights and low charges generally have prompted a movement of ore thus far this season that seems greatly in excess of requirements under present market conditions.

Tax gatherers in states and cities bordering on the lakes who are continually trying to collect excessive charges from vessel owners, will do well to heed the following maxim, contained in a letter to the governor of Tennessee, who has of late been giving considerable attention to the question of taxation generally: "Never tax anything that would be of value to your state, that could and would run away, or that could and would come to you." Ships can run away and they are always a great source of revenue to any community, especially in a district like the lakes, where their earnings are invested at the homes of their owners. Whatever may be said of the inequalities of taxation from a general standpoint, it is certain that the policy indicated in the remarks quoted is the policy that makes communities prosperous.

On one of the excursions attending the Congress of Naval Architects and Marine Engineers in London a member of the congress from the United States told a few stories of naval architecture that seem to have pleased the editor of the Engineer, one of the leading trade journals of England. "This American," says the Engineer, "did credit to the yarn-producing faculty of his countrymen. He asserted, with the utmost gravity, that a vessel recently built at Maine, in the states, was constructed of such green timber that she began to sprout all over directly she entered the tropics, her oak trenails representing shrubs along the sides, which impeded the movement of the vessel; and that when a United States cruiser was sent out to her assistance, the captain was found running up and down the deck with a lawn-mower to keep the grass down."

A report recently made to the British parliament shows the number of Atlantic voyages made during the first six months of this year at a speed of nineteen knots and over. The American line steamship St. Paul made three trips westbound and five eastbound, and the St. Louis four westbound and six eastbound, at an average speed of nineteen knots or over. Records of other ships in the same regard for the first six months of the year are: Campania, four westbound and five eastbound; Lucania, four westbound and six eastbound; Majestic, two westbound and two eastbound; Teutonic, two westbound and four eastbound; Etruria, one westbound and two eastbound; Umbria, one eastbound.

The bureau of construction and repair has informed the navy department that there is no danger of the government being held liable for penalties for delay by ship builders in their work on the hulls of the battleships Alabama, Wisconsin and Indiana. The contracts for the construction of the ships were so worded as to permit the government to weight the ships down to their designed displacement and test their speed without armor, if necessary. It is proposed to fill the double bottoms with water until they displace 11,500, and then run their trials. Upon the showing then made the department will be able to accept or reject the ships.

On all the new ships of the navy the American shield has displaced as a figure-head the designs carried on the older vessels. This is carved out of solid brass, with the stars and stripes and the shield proper fitted close around the slender bow, while scrollwork extends backward on either side for a distance of 4 or 5 feet. The New York, the Minneapolis and the Philadelphia have possibly the most elaborate designs, some having cost \$4,000 or \$5,000 each.

All steam vessels on waters of New York state over which the general government does not exercise supervision, are now subject to a law providing for inspection, licensed officers and other regulations similar to those prevailing in the United States steamboat inspection service. The new law was put through by Capt. W. S. Van Keuren, chief officer of the American Association of Masters and Pilots, who was a member of the state assembly, and who, as a reward for his efforts, has been appointed to the position of supervising inspector for the state at a salary of \$3,000 a year.

A contract for another Atlantic coast light-ship, on which bids were opened in the office of the light-house board recently, was awarded to the Bath Iron Works, Bath, Me., at \$68,875.

Low excursion rates are offered to Lily Dale, N. Y., on Cassadaga lake, via the Nickel Plate road, Aug. 13. Tickets are routed via Chautauqua lake, where the Cleveland Grays are in camp.



### Freight Movement Practically Equally to 1896.

Notwithstanding the coal strike and general complaint during the past two months of scarcity of cargoes, even at very low rates, in all lines of lake trade, it is evident from reports of traffic through the St. Mary's Falls canals that deep water and big ships are playing an important part in lake commerce this season. The volume of freight moved to and from Lake Superior to August 1 of this year is practically equal to what it was on August 1, 1897. The difference is only 300,000 tons, in favor of last year, and this figure just represents the shortage in soft coal on the first of the month, as compared with the first of August a year ago. In hard coal and iron ore the Lake Superior tonnage shows little or no difference when compared with last year's figures. The movement of wheat from the head of the lakes is about 6,000,000 bushels below last year's movement on August 1, but this is largely made up by an increase of about 500,000 barrels in flour shipments. A full summary of Lake Superior commerce, made up from reports of both canals, is contained in the following tables:

MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

ITEMS.	To August 1st, 1897.	To August 1st, 1896.	To August 1st, 1895.
Coal, anthracite, net tons.....	172,477	176,301	143,893
Coal, bituminous, net tons.....	958,377	1,301,796	662,630
Iron ore, net tons.....	4,518,716	4,471,226	4,010,540
Wheat, bushels.....	19,771,947	25,937,226	8,959,991
Flour, barrels.....	3,504,952	3,040,782	3,540,807

The total movement of freight of all kinds to and from Lake Superior to August 1 is 7,872,695 net tons, against 8,166,124 net tons on August 1, 1896, or a decrease of about 300,000 tons. The various items making up these totals are shown in the following table:

REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR, FROM OPENING OF NAVIGATION TO AUGUST 1 OF EACH YEAR FOR THREE YEARS PAST. EAST BOUND.

ITEMS.	Designation.	To August 1, 1897.	To August 1, 1896.	To August 1, 1895.
Copper.....	Net tons....	64,819	60,530	53,992
Grain.....	Bushels....	10,581,613	9,723,713	2,859
Building stone.....	Net tons....	2,378	9,255	12,520
Flour.....	Barrels.....	3,504,702	3,040,782	3,540,807
Iron Ore.....	Net tons....	4,518,716	4,471,226	4,010,540
Iron, pig.....	Net tons....	3,666	13,673	12,037
Lumber.....	M. ft. b. m.	346,095	344,647	357,180
Silver ore.....	Net tons....	5	.....	100
Wheat.....	Bushels....	19,771,947	25,937,226	8,959,991
Unclassified freight.....	Net tons....	125,365	96,257	73,609
Passengers.....	Number....	7,715	8,942	7,081

#### WEST BOUND.

Coal, anthracite.....	Net tons....	172,477	176,301	143,893
Coal, bituminous.....	Net tons ..	958,377	1,301,796	662,630
Flour.....	Barrels.....	250	62	150
Grain.....	Bushels .....	.....	1,109	28,650
Manufactured iron.....	Net tons....	50,690	44,397	31,317
Salt.....	Barrels.....	103,218	113,107	127,515
Unclassified freight.....	Net tons....	162,807	146,866	125,350
Passengers.....	Number...	8,908	9,104	7,322

#### SUMMARY.

	To August 1, 1897.	To August 1, 1896.	To August 1, 1895.
East bound freight of all kinds, net tons	6,502,748	6,471,208	5,393,065
West bound freight of all kinds, net tons	1,369,947	1,694,916	983,347
	7,872,695	8,166,124	6,376,412

The total number of vessel passages to Aug. 1, 1897, was 7,804 and the registered tonnage 7,770,671.

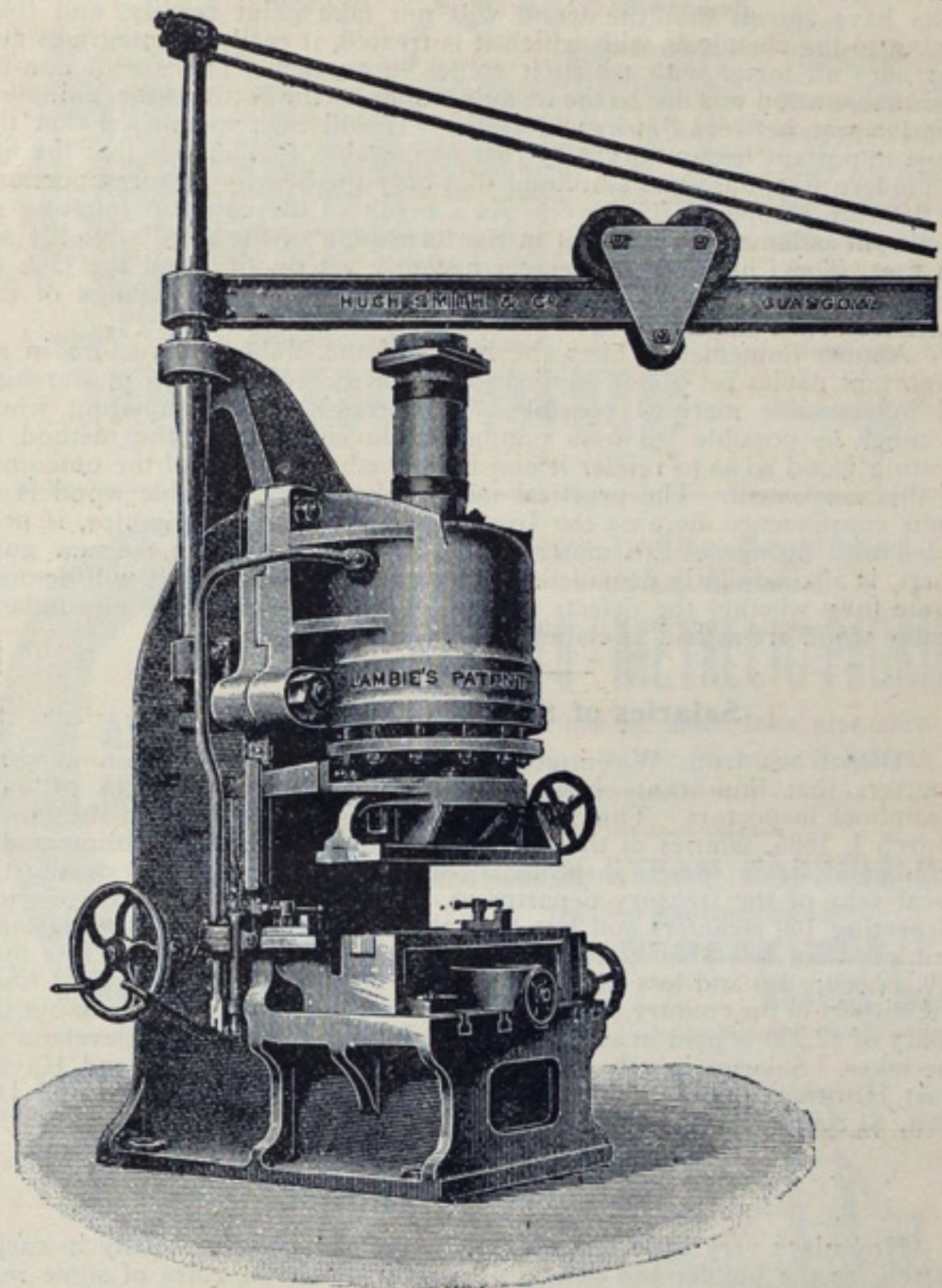
### Twin-Screw Express Steamer Normannia.

A colored illustration of the twin-screw express steamer Normannia is presented as a supplement to this issue of the Review. The Normannia is one of the principal passenger steamers of the Hamburg-American line. Her register tonnage is 8,242 and the combined horse power 16,400. The Hamburg-American line owns a fleet of 112 vessels, of which sixty-four are ocean steamers. Eighteen of these are twin-screw passenger steamers of over 7,000 tons each. The total tonnage of the line is 304,005 tons. In point of tonnage this company is, therefore, the largest steamship company in the world.

Luce's "Seamanship" is a book that is specially suited to assist young officers of the naval reserve. It is being used by naval reserve organizations all over the country. It is a standard work, selling at \$10, and will be mailed to any address at that figure by the Marine Review, 409 Perry-Payne building, Cleveland.

### Patent Hydraulic Joggling Machine.

Ship builders of this country who have visited European yards of late are interested in the practice of joggling the frames and plates of vessels. This practice, which has been referred to several times in the Review, is now quite general in English and Scotch yards, and a number of machines specially suited to the work have been designed. One of these, illustrated herewith, was first used in the works of Messrs. Russell & Co., Port Glasgow, and has since been adopted at several other large



ship yards. About a year ago the practice of joggling the frames of vessels, so as to obviate the use of shell plate packing, was started by Messrs. Russell & Co. and has since been regularly carried out, and already over thirty vessels have been built by this firm in which this improvement has been effected. The frame bars are joggled in the required places before the process of frame turning is effected, and until recently the joggling has been done at an ordinary hydraulic press, the work being facilitated by having the vertical flange of the frame bar of reduced depth, this being compensated for by increasing the size of the reverse bar. In the course of continued practice in joggling frames, Mr. Lambie, manager for the Port Glasgow firm, devised and patented the machine here referred to, which is suitable also for joggling plates.

The principal feature of the machine is that without any changing of dies the amount of joggle can be speedily and accurately adjusted, the blocks being made adjustable with an indicator to show the amount of joggle to the angle bar. A wedge arrangement is provided so that the machine is readily adapted for joggling plates, to any required extent, and this is effected without altering or unshipping any of the parts of the machine, which is self-contained for either class of work. The main bearing casting is made very strong with a powerful hydraulic cylinder acting vertically. The valve for working the machine is fitted with an automatic stopping arrangement for regulating the stroke of the machine to the required amount. As will be seen from the illustration the machine is equipped with a crane for manipulating the plates or frames to be joggled. The illustration is from the Engineers' Gazette, London.

### Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, August 7, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago.....	3,225,000	8,858,000
Duluth.....	1,015,000	81,000
Milwaukee.....	43,000	15,000
Detroit.....	79,000	12,000
Toledo.....	630,000	320,000
Buffalo.....	622,000	1,112,000
	5,614,000	10,398,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 1,008,000 bushels of wheat and an increase of 2,913,000 bushels of corn.

Excursion to Chautauqua and Cassadaga lakes via the Nickel Plate road, Aug. 13. The Cleveland Grays are in camp at Lakewood on Chautauqua lake.



### An Unsuccessful Experiment.

The announcement that Secretary Long of the navy department has directed that the use of non-inflammable wood in the construction of war ships shall be stopped for the present is somewhat surprising in view of numerous favorable reports regarding the use of this material during the past two or three years. But the secretary seems to have taken a sensible course in the matter. Non-inflammable wood was used in planking decks and in furnishing the living quarters of the ships. Practical tests have shown that the wood will not take paint readily, and that, owing to the chemicals with which it is treated, it easily disintegrates and corrodes all metal with which it comes in contact. The use of non-inflammable wood was due to the lessons taught by the battle of the Yalu during the war between Japan and China. It will be remembered that the most important lesson taught by that memorable conflict was that the fire of modern weapons is so searching that only the heavily armored portions of the ship escape its full force. As a result of the constant bursting of shells, all inflammable material in the furnishing of the ship is readily set on fire. The Chinese ships were constantly set on fire, and the task of extinguishing the flames interfered materially with the workings of the batteries of the ships.

Almost immediately after the battle of the Yalu constructors in all important navies set about eliminating from the construction of warships all inflammable material possible. The necessity for eliminating wood as much as possible led to a number of inventions and the method of treating wood so as to render it non-inflammable was one of the outcomes of this movement. The practical failure of non-inflammable wood is of some consequence, because the Iowa, the latest of our battleships, is provided with fittings of this material, and the Helena, one of the new gunboats, is also similarly provided. The career of these vessels will demonstrate fully whether the defects said to be discoverable in the non-inflammable wood are as bad as claimed.

### Salaries of Steamboat Inspectors.

Dispatches from Washington have caused the impression in some quarters that important changes have been made in salaries of local steamboat inspectors. This is a mistake. In accordance with the law of March 1, 1895, salaries of these inspectors are regulated according to the number of steam vessels inspected in their respective districts during the fiscal year of the treasury department, which ends June 30. In districts inspecting 100 steamers and less the salary is \$1,200 a year; 100 steamers and less than 150, \$1,500; 150 and less than 200, \$1,800; 200 and less than 300, \$2,000; 300 and less than 500, \$2,250; 500 and upward, \$2,500. Only one district in the country, New York, comes within the \$2,500 class, but the salary of \$2,250 is paid in six districts, including Buffalo and Cleveland on the lakes. Salaries in other lake districts at present are: Grand Haven, Port Huron, Milwaukee, Chicago and Duluth, \$2,000; Oswego and Detroit, \$1,800; Marquette, \$1,500.

### Designing a Steamship.

Nowadays very little latitude is left to a designer, especially in cargo vessels, as the builder has generally to conform to the rules of some registry society and obtain their classification. Of these societies there are a considerable number; the most important are Lloyd's Registry for the British and Foreign Shipping, the French Bureau Veritas, and the British Corporation for the Survey and Registry of Shipping.

Classification has now become practically compulsory in the United Kingdom since the passing of the 1890 load line act, and these three bodies are licensed by the board of trade to assign freeboards along with that board. Now, a freeboard can only be assigned when a vessel is up to a certain standard of strength, and must be assigned by one of the above

**U. S. ENGINEER OFFICE, Duluth, Minn.**  
July 10, 1897.—Sealed proposals for building two breakwater piers, each some 2700 feet long, at Lake Superior entrance to Portage Lake Ship Canals, Mich., will be received here until noon, Sept. 10, 1897, and then publicly opened. Information furnished on application. **CLINTON B. SEARS, Major Engrs.** Sept. 3.

**U. S. ENGINEER OFFICE, TELEPHONE Building, Detroit, Mich., Aug. 2, 1897.**  
Sealed Proposals for Dredging and Submarine Rock Excavation, in the St. Marys river, Mich., will be received here until 12 o'clock noon (Standard time) August 31, 1897, and then publicly opened. Apply here, or at U. S. Engineer Office, Sault Ste. Marie, Mich., for specifications.  
**G. J. LYDECKER, Lt. Col., Engrs.**

## The Bessemer Steamship Company

Solicits Catalogues, Prices and Discounts from manufacturers and wholesale dealers in Ship Machinery, Brass Goods, Rope, Paints, Asbestos, Packing, Hose, Furniture, Piping, Glass and Crockery, Tinware, Ranges, Carpeting, Bedding, Life-preservers, Rafts and Boats, Engineers' Supplies and Tools, Carpenters' Tools, Electric Supplies, Lamps, Gate Bars, Castings, etc., etc., etc.

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mentioned bodies, and it will thus be seen that a designer's originality is much restricted. It is fortunate, however, that we escaped the imposition of a monopoly in the assignment of freeboards which nearly became law in 1890, or even the small freedom which is now left the designer would, by this time, have practically vanished.

The designer, therefore, in preparing his midship section, has simply to turn up the rules of the registry society chosen, where he will find the scantlings for the ship of the dimensions chosen, given with more or less clearness.—Archibald Denny.

### In General.

Chitose and Kasagi are the names selected for the Japanese cruisers building by the Cramps and the Union Iron Works, respectively.

The motion for injunction in the suit of Cahall vs. Babcock & Wilcox for infringements of patents has been decided in favor of the Babcock & Wilcox Co. in the United States court, western district of Pennsylvania.

The Penberthy Injector Co. of Detroit, through one of its head officials, states that the month of June of this year was the banner month for the sale of their injectors, the total sales being the largest of any month since their plant was established, eleven years ago.

Mr. John Haug of Philadelphia, ship and engineer surveyor for Lloyd's register, has obtained a two-months' leave of absence, and while his office is closed all surveys for the register or other accounts will be attended to by the society's chief surveyor in New York, Mr. T. Congdon, No. 15 Whitehall street.

French naval officers are said to have discovered a composition that has the marvelous property of rendering vessels invisible beneath the rays of electric searchlights. It is stated that at the naval maneuvers off Brest, a torpedo boat coated with the new composition and representing the enemy, succeeded in traversing unseen the luminous zone produced by the electric projector.

A very large sale of capstans is reported by the American Ship Windlass Co. of Providence, R. I., during the first seven months of the year. With only one or two exceptions they have had the largest seven months' sales of capstans recorded on their books since beginning business. Within the last two months they have sent thirty-four of these capstans into one state, and that the next to the smallest state in the union.

The Globe Iron Works Co., Cleveland, has awarded the contract for supplying a complete outfit of steam pumps for the United States revenue cutters Nos. 4 and 5, building for lake service, to the Geo. F. Blake Mfg. Co. The outfit will consist of main and auxiliary feed pumps, fire pumps, water supply pumps, bilge pumps and air compressing pumps for the water supply system of the vessels; also the independent air pumps for the main condensers, which will be of the Blake vertical twin type. Pumps of similar make were supplied the revenue cutter Gresham, built by the Globe company, and also to the cutters Daniel Manning and McCulloch, built on the coast.

\$3.00 to Niagara Falls via the Nickel Plate road, Aug. 5. Special train leaves Cleveland at 10:00 p. m. Sleepers. 243, Aug 5

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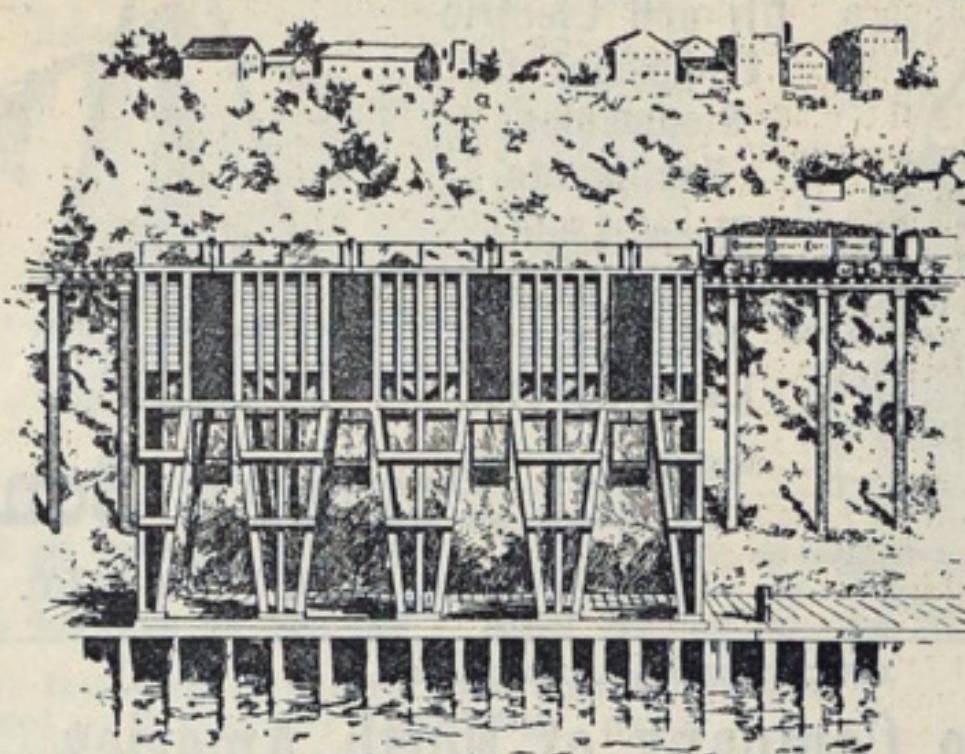


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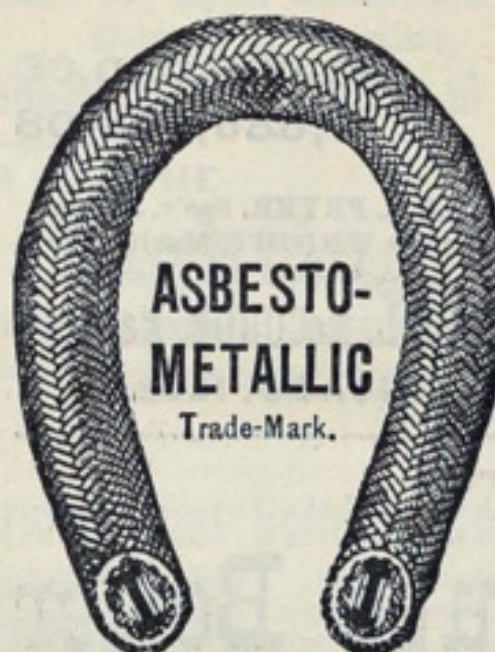
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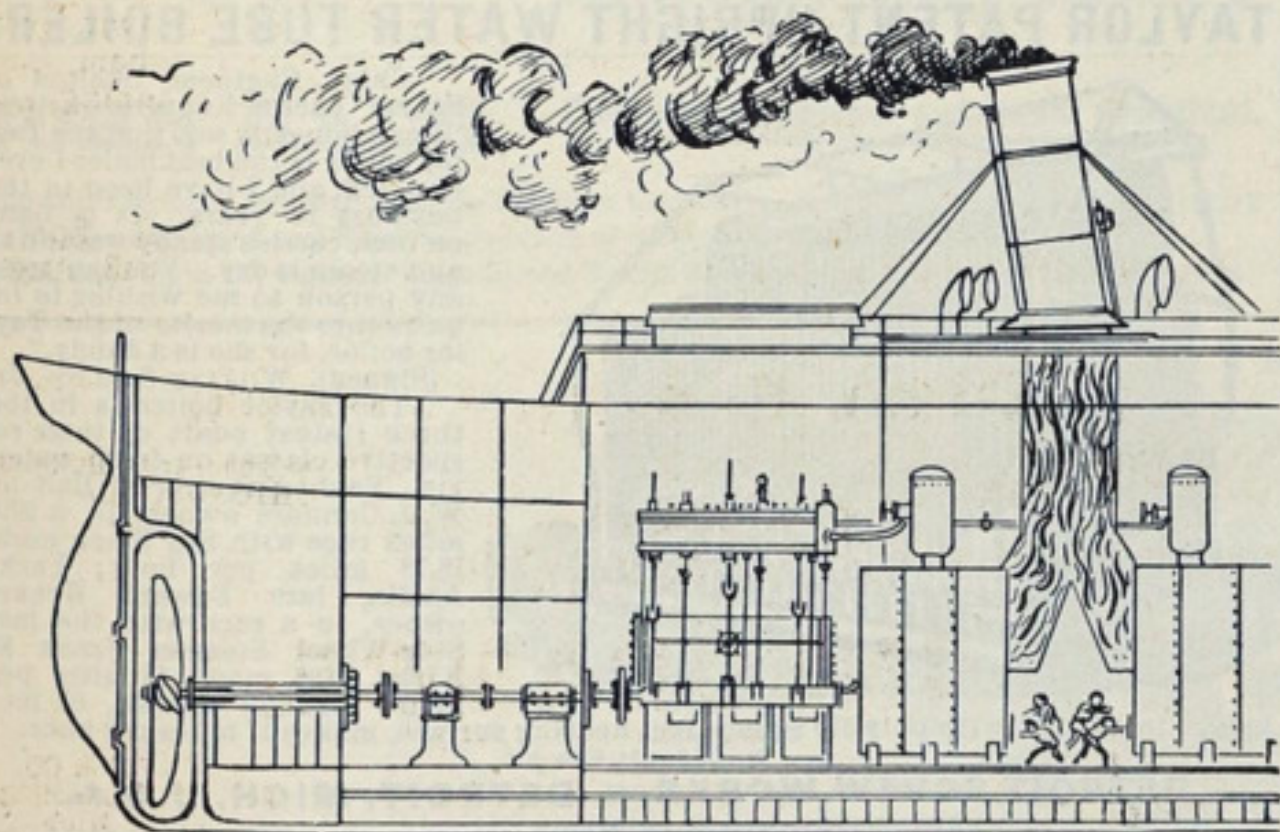
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Fuel, 165 tons.....	\$348 61									25
Oils.....	15 14					15 14				
Repairs.....	1 00					1 00				
Supplies.....	11 66	\$376 41				11 66				
STEWARD'S DEPT.								289 26		
Provisions.....	119 20									
Supplies.....	3 37	122 57						122 57		
Handling Cargoes (unloading).....	364 40									
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Towing.....	12 00									
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Sundry.....	13 15	411 18						411 18		
WAGES—ELEVEN DAYS.										
Captain.....	\$175.00 per mo.	64 16				64 16				
Mate.....	80.00	29 33				29 33				
2d Mate.....	56.00	20 54				20 54				
2 Wheelmen.....	34.00 (12.46)	24 92				24 92				
2 Lookouts.....	34.00 (12.46)	24 92				24 92				
1st Engineer.....	112.50	41 25				41 25				
2d Engineer.....	80.00	29 33				29 33				
2 Greasers.....	34.00 (12.46)	24 92				24 92				
3 FIREMEN.....	34.00 (12.46)	37 38				37 38				
4 Deck-hands.....	17.00 ( 6.23)	24 92				24 92				
1st Cook.....	60.00	22 00				22 00				
2d Cook.....	17.00	6 23	349 90			6 23		349 90		33 1/2
Total Expenditures.....		1260 06						1172 91		

Up Cargo,	2453	(1900)	net tons.
Down "	2265		gross "

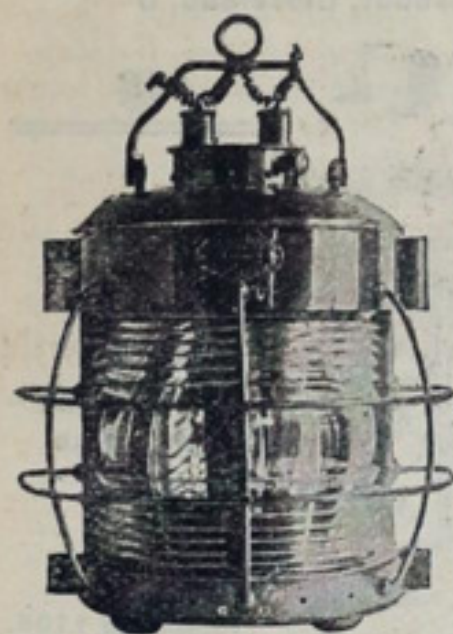
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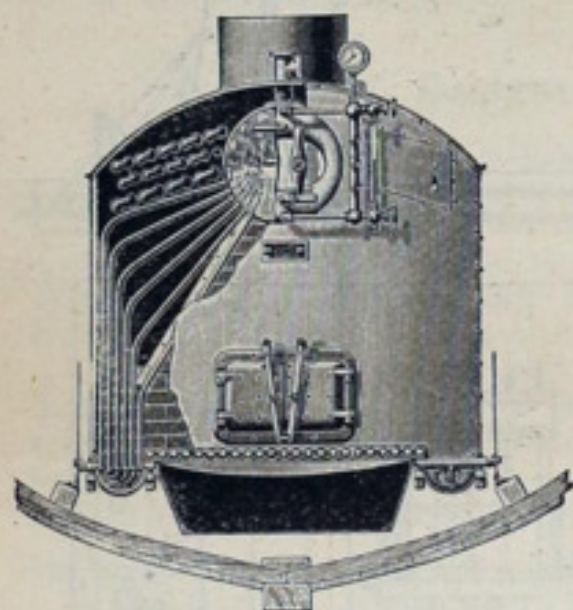
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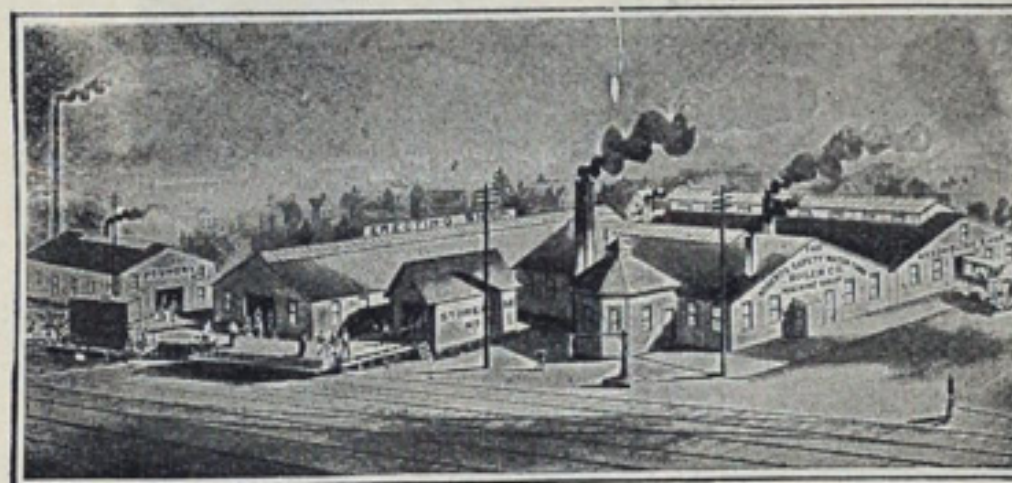
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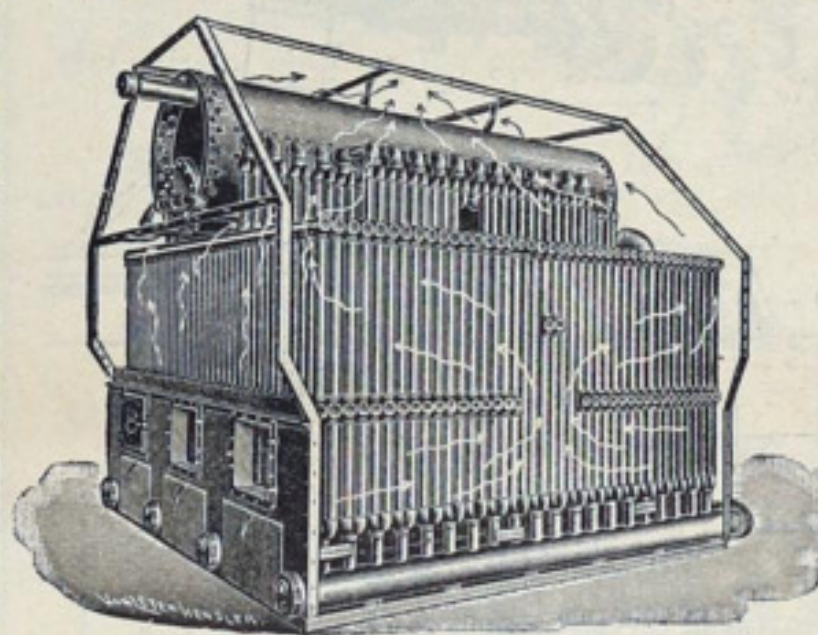
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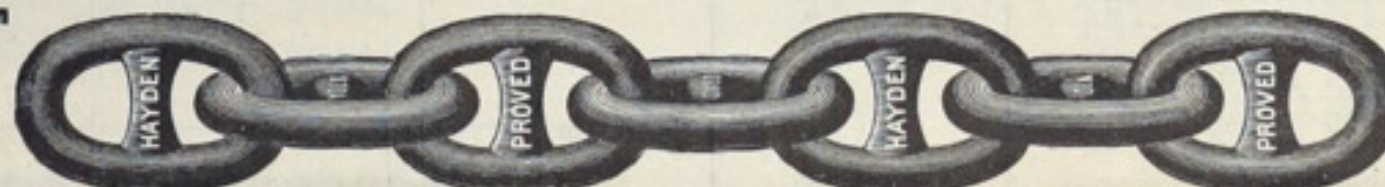
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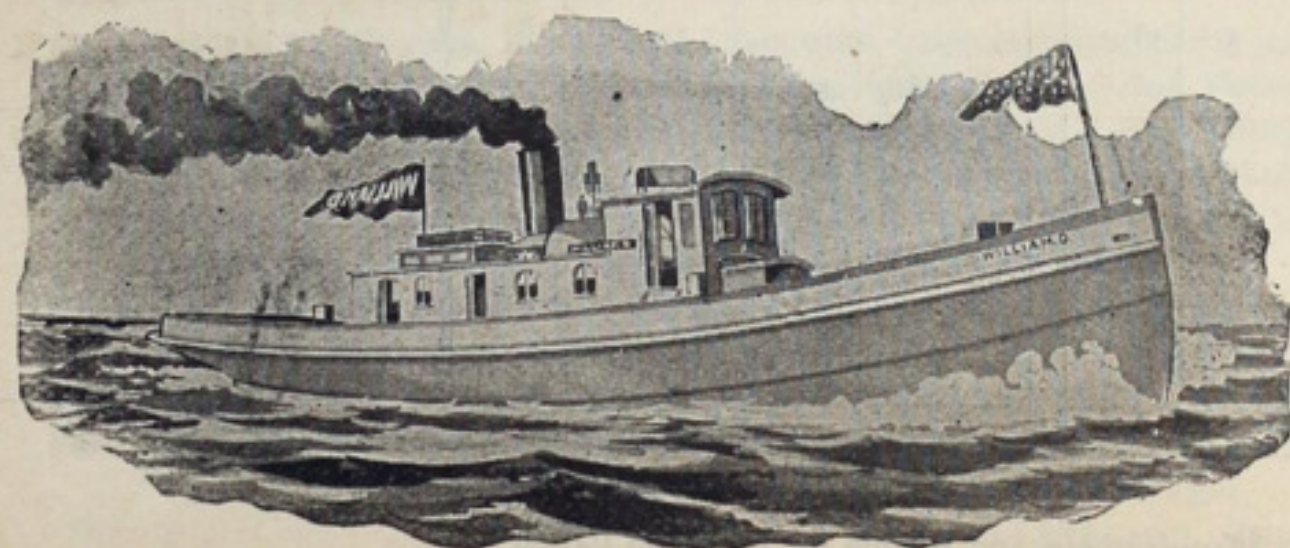
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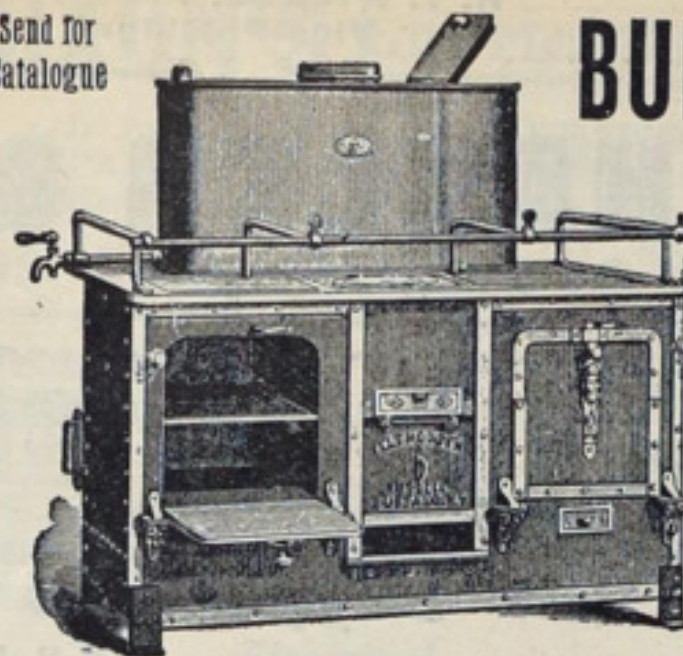
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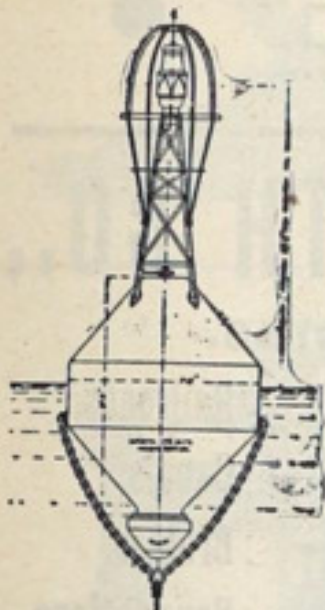
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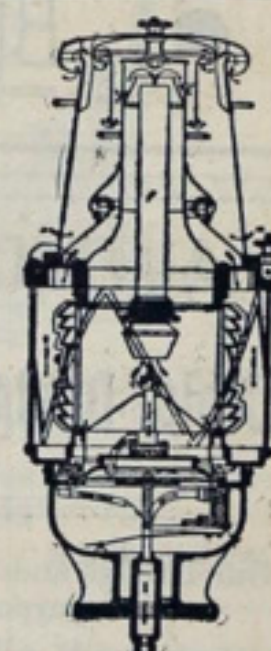
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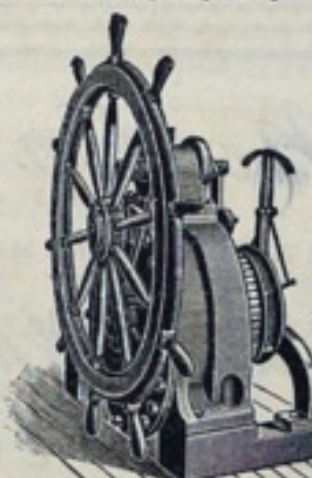


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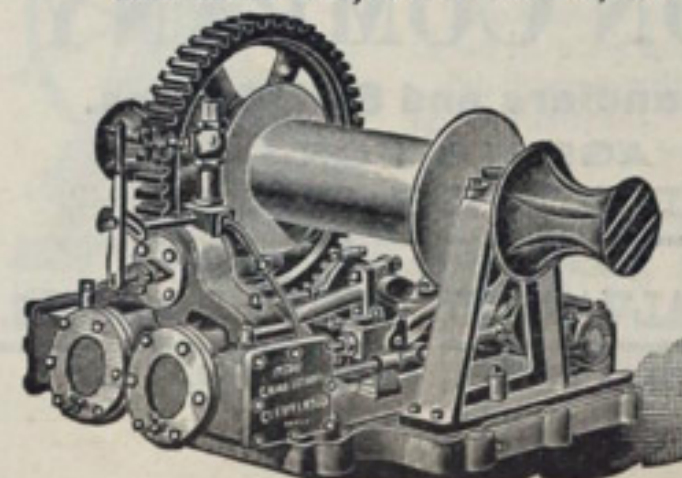
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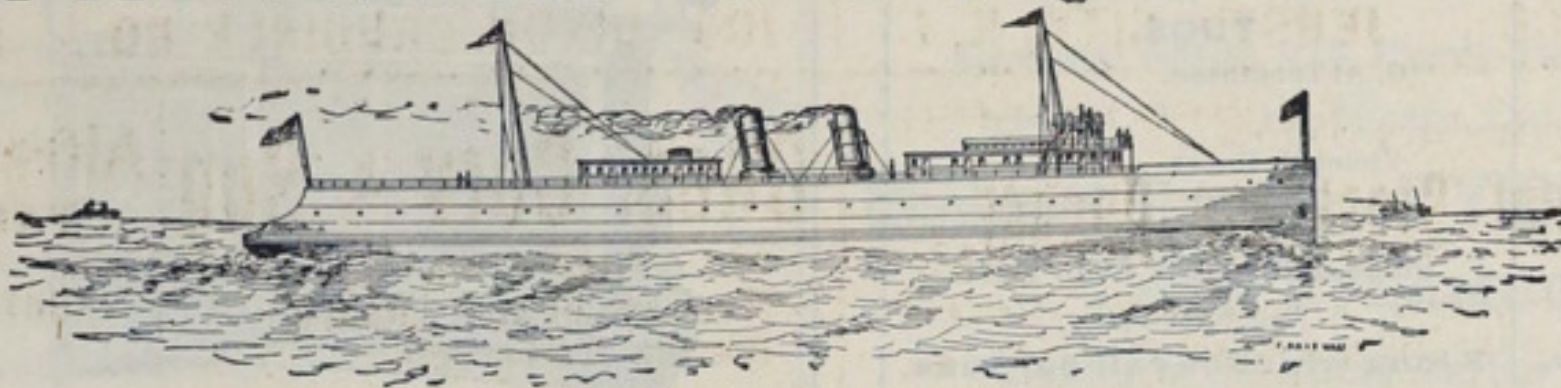
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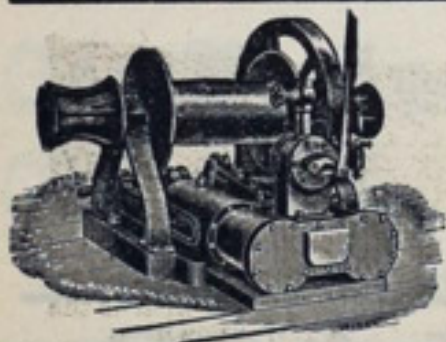
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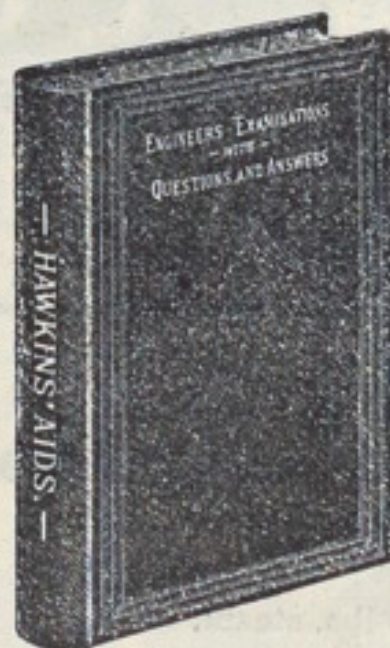
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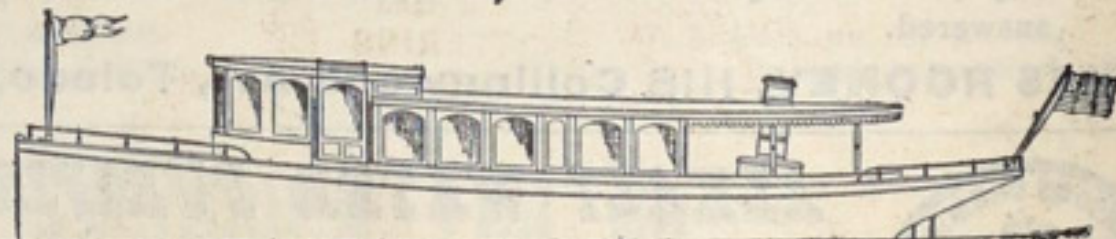
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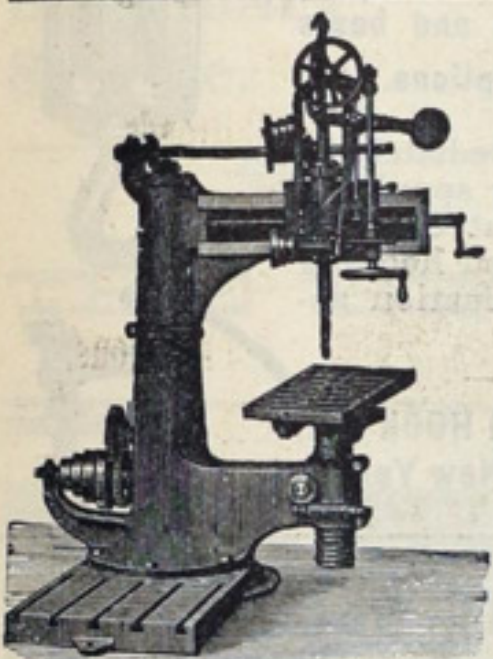
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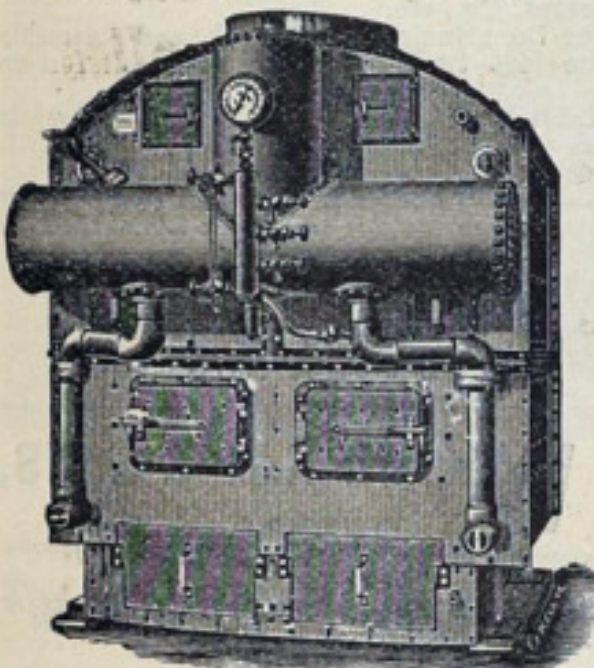
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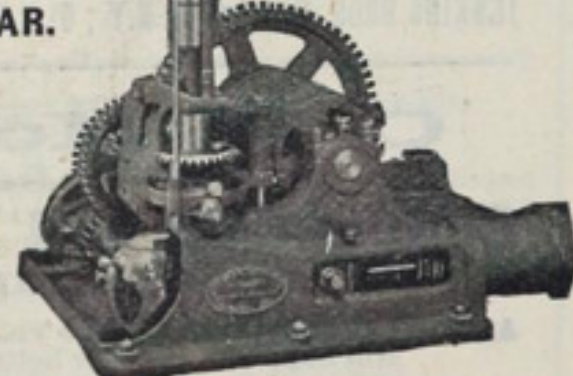


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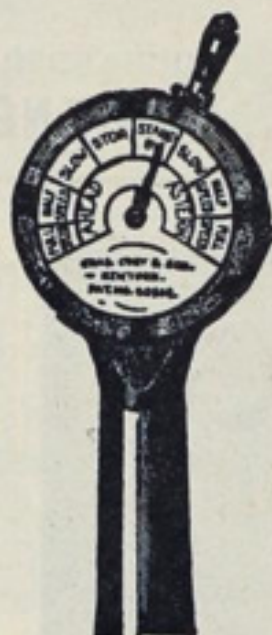
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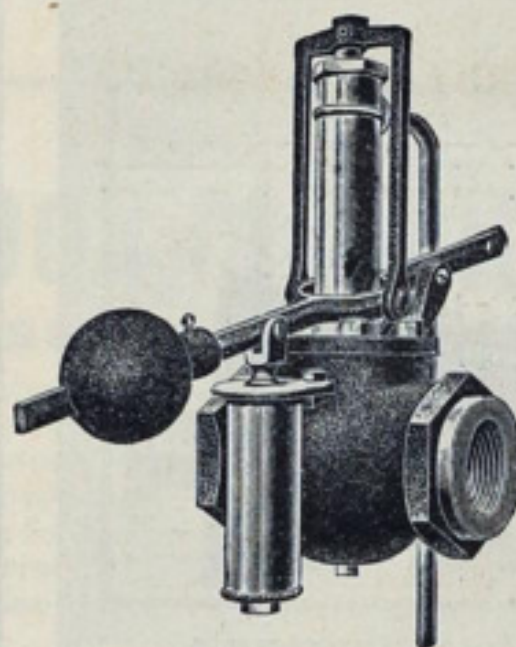


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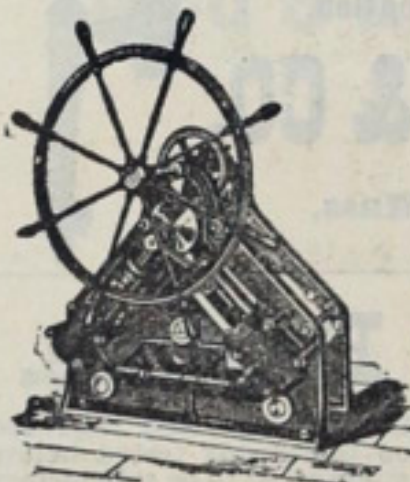
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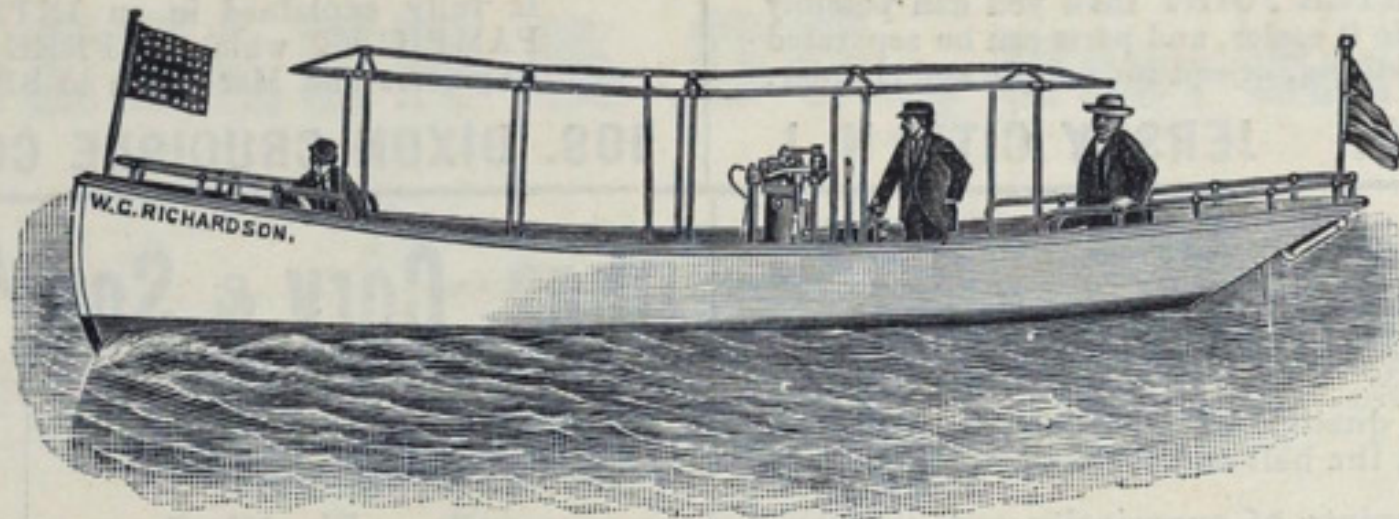


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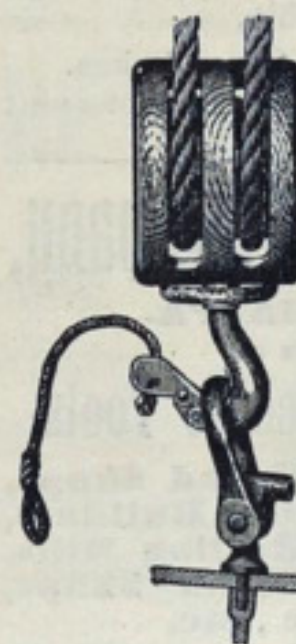
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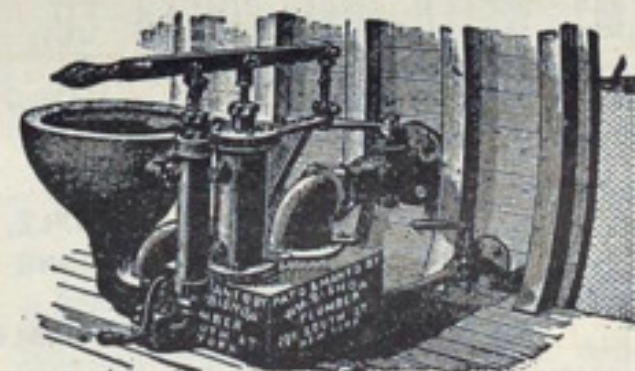
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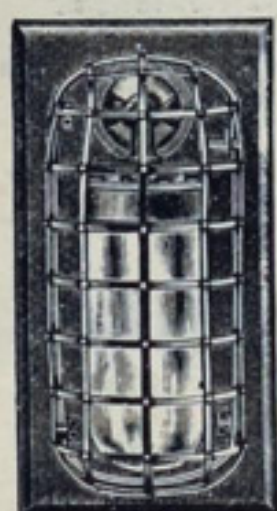
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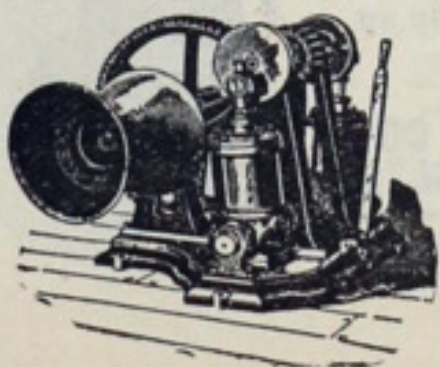
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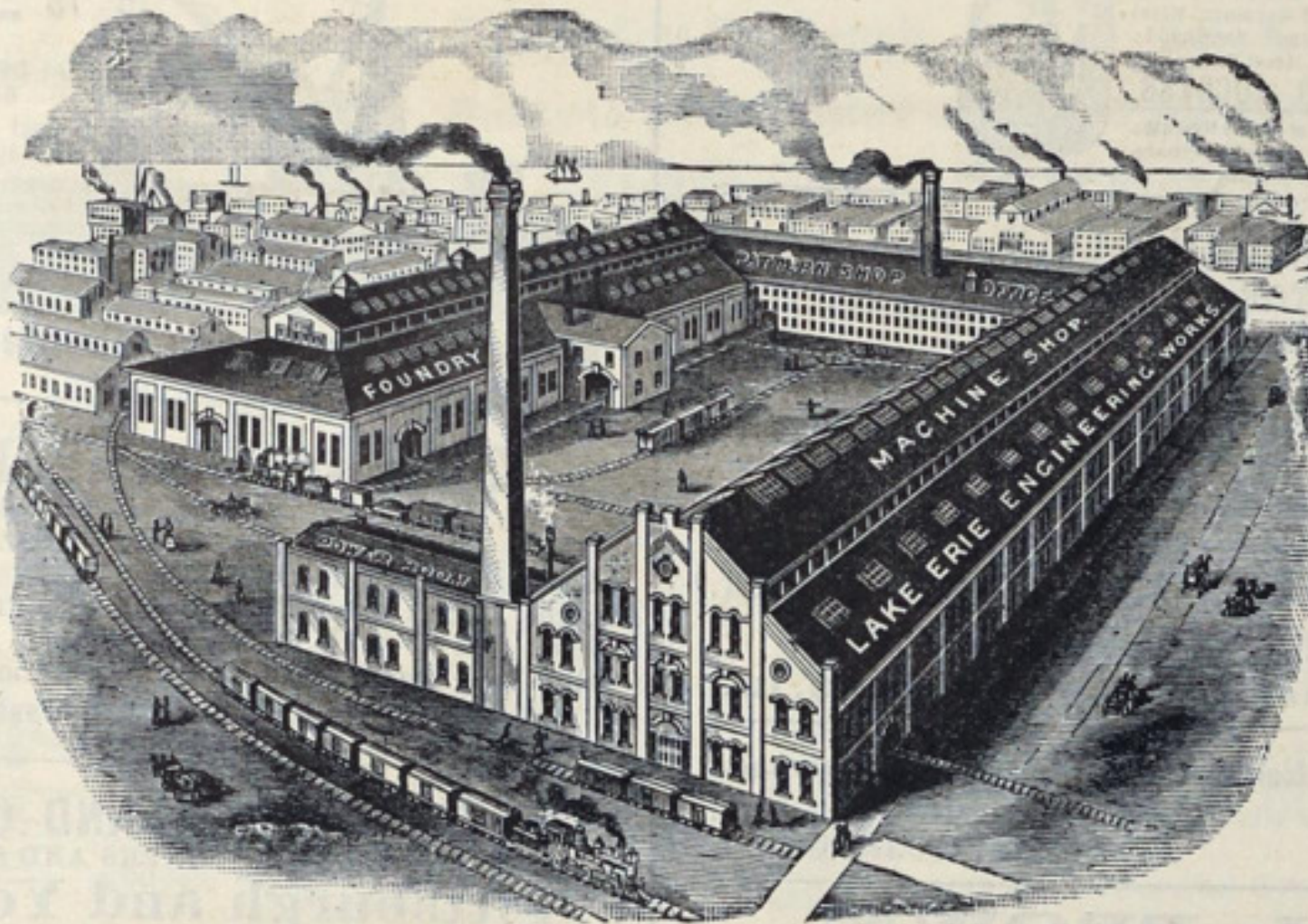


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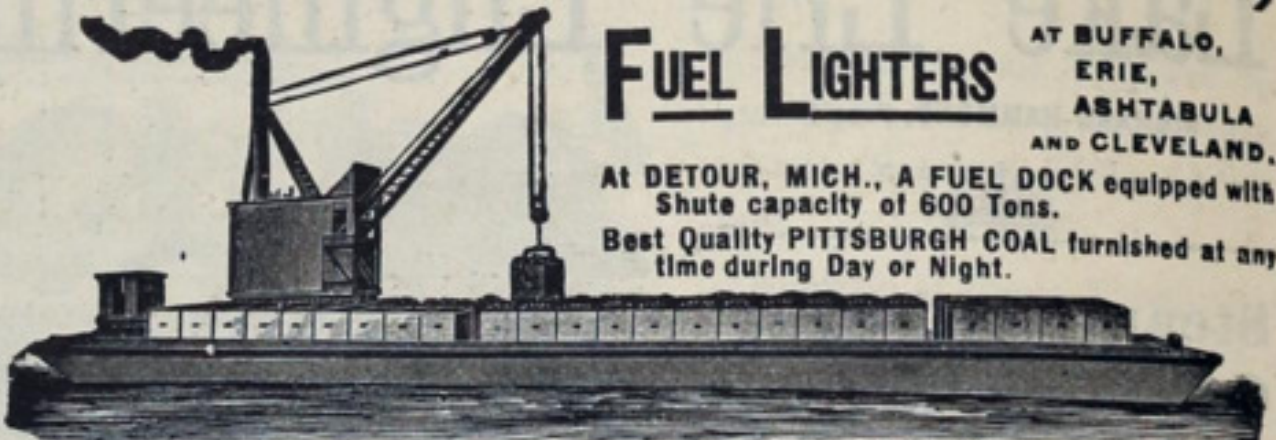
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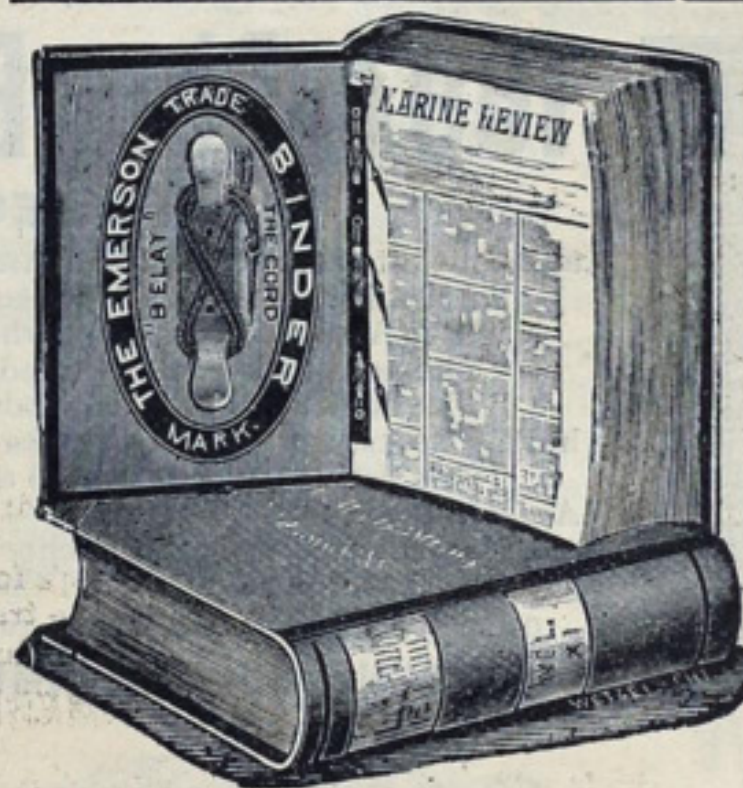
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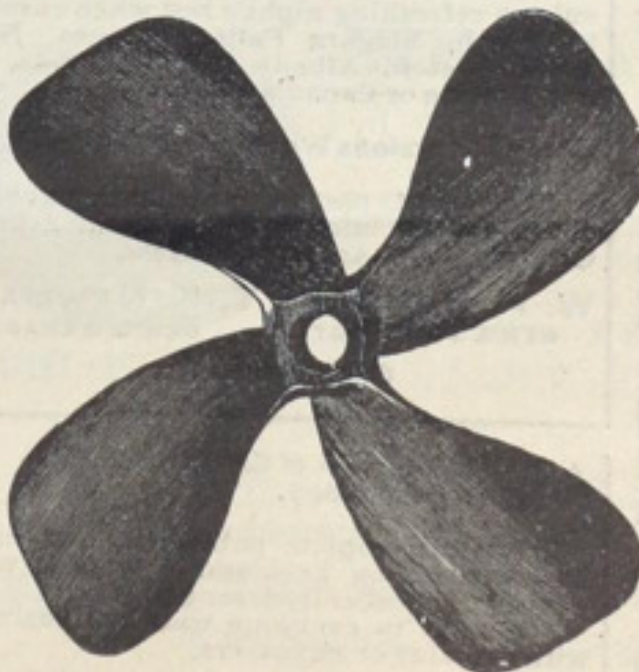
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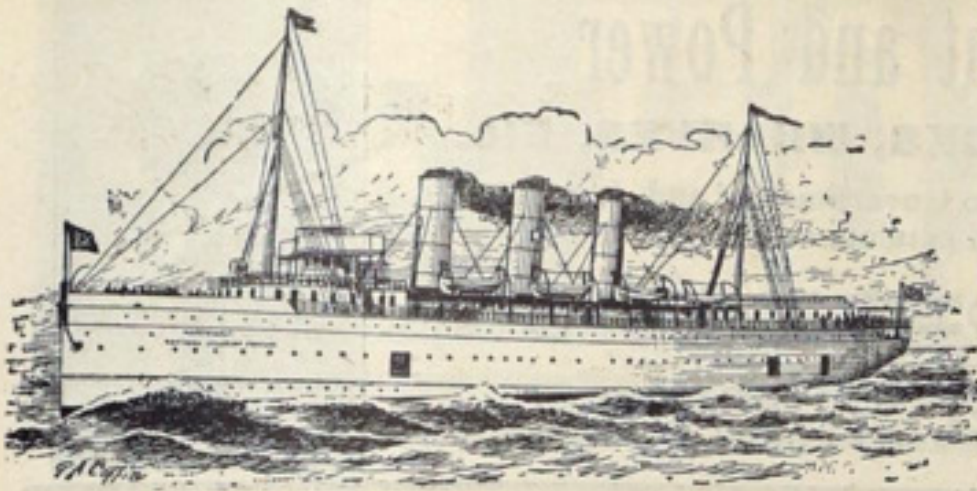
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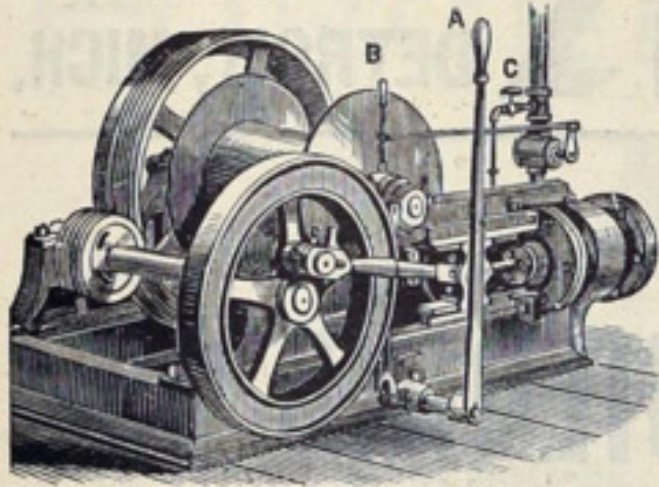
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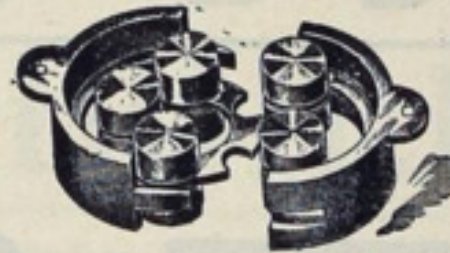
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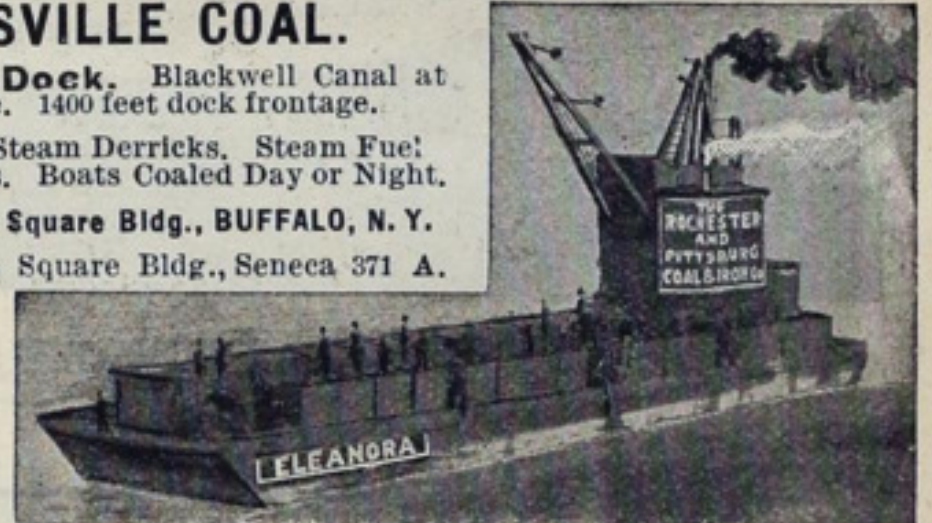
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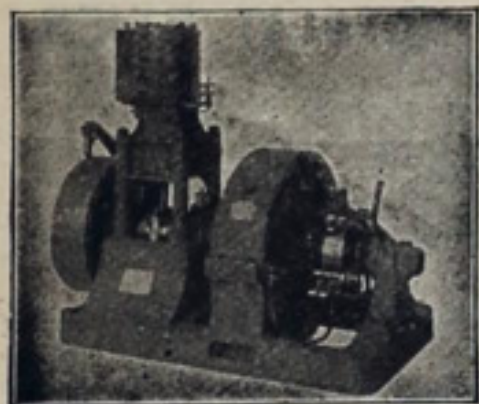
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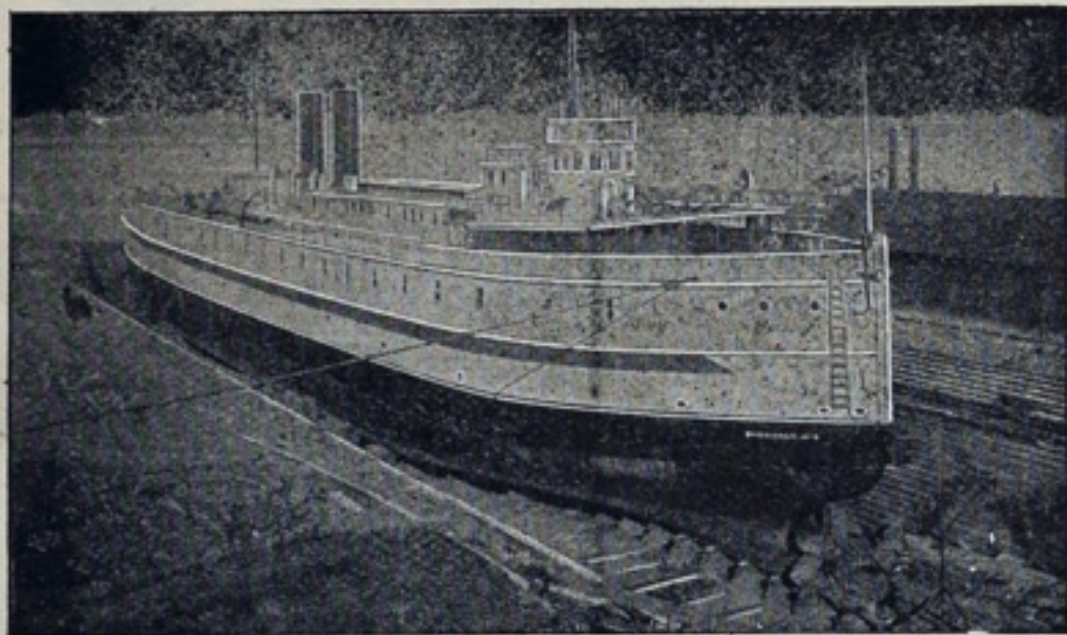
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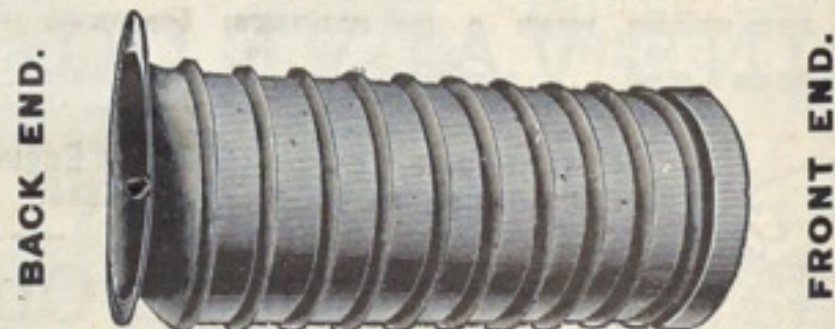
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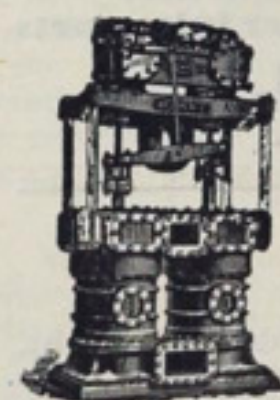
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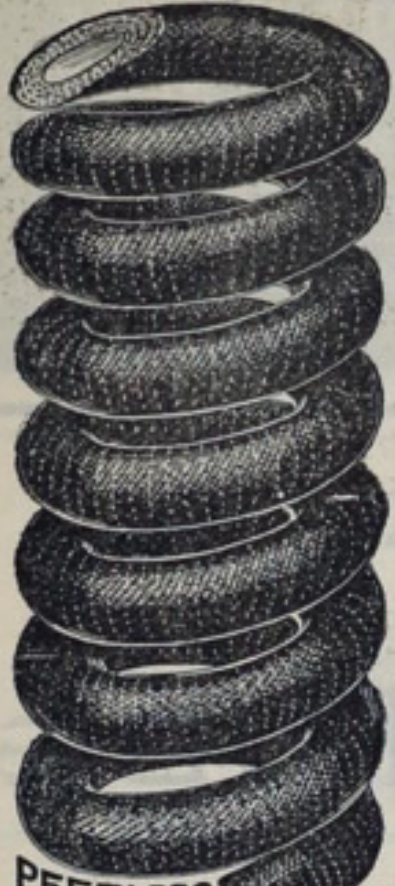


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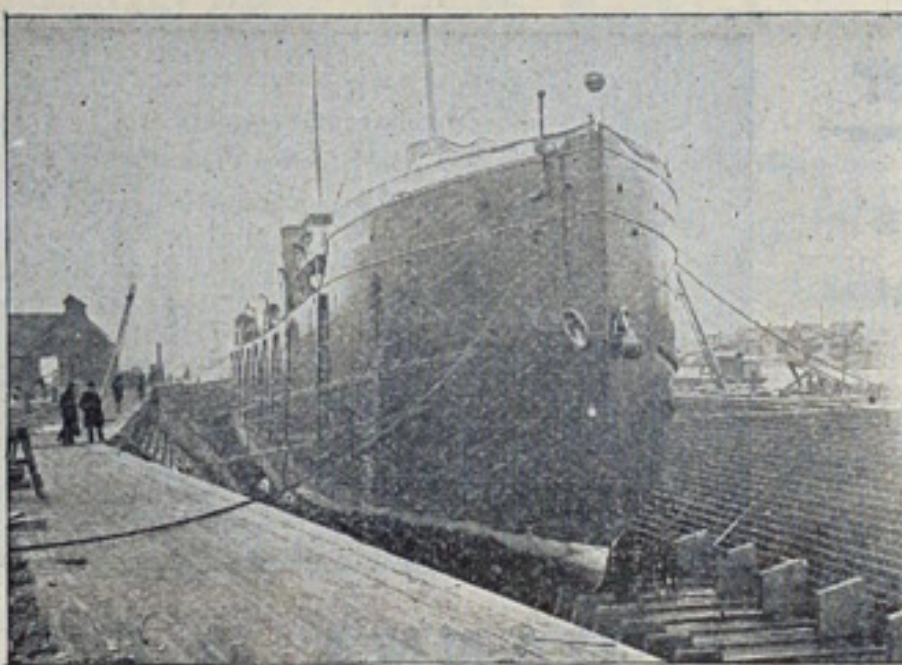
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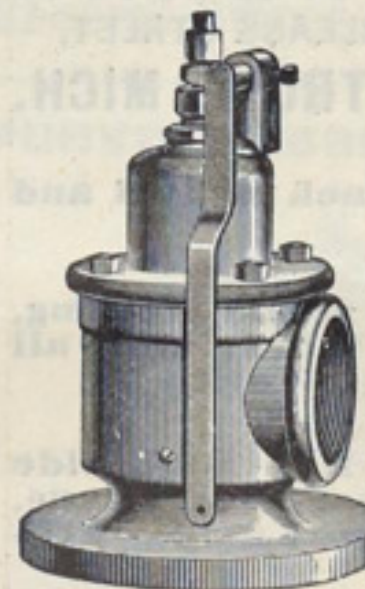
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